

# ADDITIONAL SOIL AND GROUNDAWTER SAMPLING

SAUGET AREA 2 SITES SAUGET, ILLINOIS



URS Corporation 1001 Highland Plaza Drive West, Suite 300 St. Louis, MO 63110 (314) 429-0100 **Project** #

# ADDITIONAL SOIL AND GROUNDAWTER SAMPLING

SAUGET AREA 2 SITES SAUGET, ILLINOIS

May 2007
URS

URS Corporation 1001 Highland Plaza Drive West, Suite 300 St. Louis, MO 63110 (314) 429-0100 Project #

# Sauget Area 2 Sites Group

May 9, 2007

Mr. Timothy Fischer U. S. Environmental Protection Agency, Region 5 77W. Jackson Blvd. (SR-6J) Chicago, IL 60604-3590

Re: Sauget Area 2 - Sauget, Illinois

Dear Mr. Fischer:

Enclosed is the Data Validation Report for the Supplemental Investigation Phase 2 & 3.

Please call us with any comments or questions on this report.

Sincerely,

Gary Uphoffs. By SD.Smith

Gary D. Uphoff Co-Project Coordinator Steven D. Smith

Co-Project Coordinator

cc: Sar

Sandy Bron - 2 Hard Copies & 2 CDs

Clair Morris – 1 Hard Copy & CD

SA2SG File

# **TABLE OF CONTENTS**

GLOSSARY OF ACRONYMS AND ABBREVIATIONS			
SECTION 1	INTRODUCTION	1-	
	<ul><li>1.1 Project Description</li><li>1.2 Overall Project Objectives</li></ul>		
SECTION 2	FIELD ACTIVITIES	2-	
	2.1.2 Equipment Decontamination 2.1.3 Sample Verification	2-1 2-2 2-2 2-2	
SECTION 3	CHAIN OF CUSTODIES		
	3.1 Sample Documentation	3-1	
SECTION 4	ANALYTICAL PROCEDURES		
	4.1.2 Semi-Volatile Organics	4-1 4-1 4-1 4-1 4-1 4-1 4-1 4-2 4-2 Parameters 4-2	
SECTION 5	DATA REVIEW/VALIDATION PROCESS	5-1	
	<ul><li>5.1 Data Review/Validation Elements</li><li>5.1.1 Completeness of Data Package</li></ul>		



# **TABLE OF CONTENTS**

		5.1.2 Sample Preservation and Holding Times	5-3		
		5.1.3 Blanks			
		5.1.4 Surrogates			
		5.1.5 Laboratory Control Samples			
		5.1.6 Matrix Spike/Matrix Spike Duplicate Samples			
		5.1.7 Field Duplicate Samples			
		5.1.8 ICP Serial Dilution (Metals Data Review Only)			
		5.1.9 Instrument Performance Check (Data Validation Only)			
		5.1.10 Preparation and Run Log Review (Data Validation Only)			
		5.1.11 Chromatogr am Review (Data Validation Only)			
		5.1.12 I nitial Calibration (Data Validation Only)	، -3		
		5.1.13 Calibration Verific ation (Data Validation Only)			
	5.2	5.1.14 I CP Interference Check Sample (Metals Validation Only)			
	3.2	Measurement of Quality Assurance Objectives			
		5.2.1 Precision			
		5.2.3 Completeness			
		5.2.4 Representativeness			
		5.2.5 Comparability	5-3 5-0		
	5.3	Data Assessment			
	5.5	5.3.1 Summary of Data Quality Requirements			
		5.3.2 Data Usability Assessment			
SECTION 6	DATA REVIEW 6-				
	6.1	Data Quality Review Checklists for All SDGs			
SECTION 7	DATA VALIDATION				
	. 7.1	Introduction	7-1		
	7.2	Level IV Validation of Data			
SECTION 8	DATA ASSESSMENT				
	8.1	Overall Data Assessment	Ջ_1		
	8.2	Sampling Issues			
	8.3	Data Review/Validation Issues			
	8.4	Appropriateness			
	8.5	Limitations			
SECTION 9	REFE	RENCES	9-1		



# **TABLE OF CONTENTS**

# **List of Tables**

Table 1-1 Table 2-1	Summary of Collected Samples Sauget Area 2 Summary of Field Duplicate Samples Sauget Area 2
Table 4-1	Data Review/Validation Qualifier Codes
Table 6-1	Summary of Qualifications for SDG SAS044
Table 6-2	Summary of Qualifications for SDG SAS045
Table 6-3	Summary of Qualifications for SDG SAS046
Table 6-4	Summary of Qualifications for SDG SAS047
Table 6-5	Summary of Qualifications for SDG SAS048
Table 6-6	Summary of Qualifications for SDG SAS049
Table 6-7	Summary of Qualifications for SDG G6G070273
Table 6-8	Summary of All Qualifications for SDGs SAS044 – SAS049 and
	G6G070273

# **List of Appendices**

Appendix A	Analytical Results
Appendix B	Copies of COCs

Appendix C Level III Review and Level IV Validation Checklists



Glossary of Acronyms and Abbreviations

# **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

CCC Calibration Check Compound

CVCalibration Verification

CLP Contract Laboratory Program

CM Corrective Measures

COC Chain of Custody

DI Deionized

DO Dissolved Oxygen

**DQO** Data Quality Objective

eV Electron volt

**FSP** Field Sampling Plan

GC/MS Gas Chromatography/Mass Spectrometry

HCl Hydrochloric Acid

**ICP-AES** Inductively Coupled Plasma- Atomic Emission Spectrometry

**ICS** Interference Check Sample **ICV** Initial Calibration Verification

ID Identification

IDL Instrument Detection Limit **IDW** Investigative-Derived Waste

**IEPA** Illinois Environmental Protection Agency

IS Internal Standard Estimated Value

**LCS** Laboratory Control Sample

**MCAWW** Methods for Chemical Analysis of Waters and Wastes

**MDL** Method Detection Limit

**MNA** Monitored Natural Attenuation

MS/MSD Matrix Spike/Matrix Spike Duplicate

ND Nondetect

%D Percent Difference %R Percent Recovery

%RSD Percent Relative Standard Deviation

**PARCCS** Precision, Accuracy, Representativeness, Completeness, Comparability

and Sensitivity

**PCB** Polychlorinated Biphenyl

**PCDD** Polychlorinated Dibenzodioxins **PCDF** Polychlorinated Dibenzofurans



# **GLOSSARY OF ACRONYMS AND ABBREVIATIONS**

pН Hydrogen ion exponent

PID Photo ionization Detector

**PPE** Personal Protective Equipment

QA/QC Quality Assurance/Quality Control

**QAPP** Quality Assurance Project Plan

Correlation coefficient r

R Rejected value RF Response Factor RLReporting Limit

**RPD** Relative Percent Difference **RSK** Robert S. Kerr Laboratory SA2SG Sauget Area 2 Sites Group **SDG** Sample Delivery Group

SOP Standard Operating Procedure **SSHP** Site Safety and Health Plan **STL** Severn-Trent Laboratories

**TAL Target Analyte List** 

U Nondetect Value (under the MDL)

Estimated Nondetect (under the MDL) UJ

**URS** Corporation **URS** 

**USACE** U.S. Army Corps of Engineers

**USEPA** U.S. Environmental Protection Agency

**VOA** Volatile Organic Analysis **VOCs** Volatile Organic Compound

WP Work Plan



Section 1

**SECTIONONE** 

The purpose of this investigation was to collect additional soil and groundwater samples as part of a Supplemental Investigation conducted at the Sauget Area 2 Sites in Sauget, Illinois. This Validation Report discusses the laboratory analyses of soil and groundwater samples performed by Severn Trent Laboratories located in Savannah, Georgia and Sacramento, California. The field investigation was conducted by URS Corporation (URS). Field quality control activities such as equipment decontamination, field equipment calibration, sample verification that could have affected the data are also addressed. The data usability is assessed in this Report in support of additional data characterization for the site.

#### 1.1 PROJECT DESCRIPTION

The sampling performed was to fill gaps in the data characterization at the Sauget Area 2 Sites. The scope of work was developed after several working meetings were conducted between the Sauget Area 2 Sites Group's (SA2SG) and the Agency. The rationale for each specific sampling activity, which included the type, number, and location of samples to be collected, was agreed upon by SA2SG, United States Environmental Protection Agency (USEPA), USEPA's oversight contractor CH2M Hill and Illinois Environmental Protection Agency (IEPA). Surface and subsurface soil samples were collected from soil borings associated with both the data gap and NAPL investigations. Groundwater samples were collected from monitoring wells. The sampling was completed using Standard Operating Procedures (SOPs), which are included in the Supplemental Investigation Phase 2 and 3 Work Plan (Work Plan). The samples collected as part of this investigation are listed in Table 1-1 of this report.

#### 1.2 **OVERALL PROJECT OBJECTIVES**

The objective of the sampling was to fill the data gaps identified by the Agency. The scope of work was agreed between SA2SG and the Agency. All historical documents, aerial photographs, and analytical results relevant to the various projects in Sauget were reviewed before the scope of work was finalized.



#### **QUALITY CONTROL ACTIVITIES** 2.1

Document review and decontamination activities took place prior to and concurrent with the field program implementation. Communication with the project manager clarified and confirmed the proposed sampling activities when conflicting information was encountered in the work plan document. The review and continuous communication assured that the samples collected during this program would meet prescribed project guidelines and satisfy the project data quality objectives (DQOs). Documentation of sampling activities and sample shipment chain-of-custody (COC) records were designed to confirm that all proposed investigation activities were completed as planned. Copies of the COC forms are presented in Appendix B of this report.

#### 2.1.1 **Document Review**

Prior to the startup of field activities, the Work Plan, the Quality Assurance Project Plan (QAPP), and the Health and Safety Plan were provided to the members of the field sampling teams for their review. This familiarized them with the site being investigated, the objectives of the investigation, and the SOPs under which the field activities were to be completed. Field personnel were briefed on the work to be completed prior to project startup. Coordination of the field sampling activities was maintained through open communication among project management personnel, the field sampling teams, and the analytical laboratories.

#### 2.1.2 **Equipment Decontamination**

The equipment decontamination was performed in accordance with SOP No. 4 (Decontamination) of the Work Plan. Mobile decontamination supplies were provided to ensure that re-usable equipment was decontaminated between sampling locations. An Alconox<sup>®</sup> and potable water mixture solution was used on all reusable equipment after each sample was collected. A distilled water rinse was applied after the Alconox® mixture. Disposable nitrile gloves were worn during decontamination activities, and were changed between locations. Reusable equipment includes but is not limited to the stainless steel trowels, spoons, well probes, and pumps. All new tubing was used at each well location. Decontamination activities during the field investigation were overseen and verified at various times by the URS Field Supervisor.

Used decontamination solutions and solid waste generated during the sampling activities were stored on-site in double-walled tanks and roll-off boxes for later disposal.



#### 2.1.3 **Sample Verification**

During field activities, the field sampling team reviewed the QAPP to verify the sample collection requirements for each sampling location. The review included the verification of target analytes, sample container requirements and the quality assurance/quality control (OA/OC) sampling requirements. Information concerning the number and type of samples collected at each location was documented as identified in Section 2.2.2. Any questions or inconsistencies that arose during the field activities were directed to the URS Project Manager for resolution.

#### 2.1.4 **Field Equipment Calibration**

All field instrumentation was calibrated prior to and during continued use. The calibration and maintenance history of project-specific field instrumentation is an important aspect of the project's overall QA/QC program. Trained personnel followed the manufacturers' recommended instructions and SOP No.3 (Calibration and Maintenance of Field Instruments) to complete all initial and continuing calibration procedures. This ensured the equipment was functioning within the tolerances established by the manufacturer and the USEPA methodspecific requirements, where applicable. The calibration and maintenance was the responsibility of the field supervisor and documented in Equipment Calibration Log Forms. Entries in the Form included:

- Date and time of calibration
- Type of equipment
- Name of person completing calibration
- Reference standard used for calibration
- Initial reading.

Air monitors equipped with a 10.2 electron volt (eV) photo ionization detector (PID) lamp were utilized to perform air monitoring during activities. The air monitors were calibrated daily in accordance with manufacturer's instructions. Details of the air monitoring procedures and other health and safety procedures are described in the Health and Safety Plan.

Temperature, pH, conductivity, dissolved oxygen (DO), oxygen reducing potential (ORP), and turbidity were measured in the field at all the groundwater locations sampled. Measurements were made using a Troll 9000 water quality meter following manufacturer procedures. Prior to



the daily field activities, the water quality meter was calibrated and verified to be within the instrument manufacturer's specified criteria.

#### 2.2 SAMPLE COLLECTION ACTIVITIES

Samples were collected for chemical analyses during the investigation in accordance with the field sampling procedures summarized in the Work Plan. The samples were collected at the Sauget Area 2 Sites from May to July 2006. Table 1-1 of this Quality Summary Control Report (OSCR) summarizes the samples collected and includes sample identification, sampling date and time, sample matrix, and parameters analyzed for each sample.

Samples were submitted to Severn-Trent Laboratories (STL) in Savannah, Georgia for all parameters with the exception of the Dioxin sample. This sample was sent to STL in Sacramento, California.

#### 2.2.1 Sample Containers, Handling, and Labeling

The samples were placed in certified pre-cleaned sample containers containing preservatives, if required, sealed, and affixed with a sample label in accordance with the Sample Handling Procedures listed in SOP No. 25 (Sample Containers, Preservation and Holding Times). The samples were then placed immediately on ice. Sample labels included the sample identification number, the target analytes, the type of QC for the sample being collected, sampler's initials, and the sample collection date and time as specified in Section 5 of the QAPP. Sample labels were covered with clear tape to prevent the tearing or loss of the sample identification label, should it become wet or abraded, in the sample cooler during transit.

Sample information, such as identification numbers, targeted analytes, sampling times, and QA/QC sample types, was documented on COC forms for shipment to the analytical laboratory. Completed COC forms were signed and one copy of the completed COC form was removed and retained for the field and office files. URS St. Louis packed the coolers after the daily sampling collection activities were completed and shipped them via overnight delivery service to STL Savannah or Sacramento.

The analytical laboratories and URS were in contact regularly regarding the number and type of samples shipped. These conversations also allowed for the expedient resolution of any questions or discrepancies arising from previous sample shipments.



**SECTIONTWO** 

#### 2.2.2 **Documentation of Field Activities**

Field logbooks and sample collection field sheets were completed for the documentation of the field activities. All field activities and samples collected were documented in the field logbooks. Sample collection was also documented on the COCs. In addition, the groundwater samples were documented on sample collection field sheets.

#### 2.2.3 Sample Designation

Samples collected were labeled with unique sample identification as summarized in Section 4 of the QAPP. There was no transcription errors associated with the samples collected.

# 2.2.4 Field QA/QC Samples

QA/QC activities in the field included the collection of field blank/trip blank, duplicate sample pairs, and matrix spike/matrix spike duplicate (MS/MSD) samples. The following sections detail the field QA/QC samples collected.

#### 2.2.4.1 Trip Blank Samples

Trip blanks accompanied samples collected for volatile organic analyses and consisted of VOA vials filled with organic-free water and chemical preservative hydrochloric acid (HCl) at the laboratory. Trip blank samples were shipped by the laboratory to the site with the empty sample containers and sent back to the laboratory with environmental samples. The VOA vials were opened only in the laboratory at the time of analysis. At least one trip blank sample accompanied each cooler, which contained volatile organic compounds (VOC) samples, used to ship samples to the laboratory. Trip blank information was used to estimate error associated with sample shipment, sample containers and laboratory analysis.

## 2.2.4.2 Field Duplicate Samples

Field duplicate samples were collected and submitted for analysis at an approximate ten percent frequency. Field duplicates were collected following the same procedures as the original samples. The field duplicates were submitted to STL as routine analytical samples.

Field duplicate results provided estimates for overall precision of sample collection, field sample preparation, and laboratory analysis. The duplicate sample data was used to assess the usability of the sample data. Field duplicates are identified in Table 2-1. The results of the field duplicate samples are discussed in the data reviews summarized in Appendix C of this Validation Report.



## 2.2.4.3 Matrix Spike/Matrix Spike Duplicate Samples

The field supervisor selected which samples were used for MS/MSD analysis. Samples collected for MS/MSD analysis had 2 times the required volume submitted to the laboratory for the additional analyses. MS/MSD data was evaluated to assess accuracy and precision of the methods utilized for the analyses of samples associated with the field activities. Results of the MS/MSD samples are discussed in the data reviews and data validations summarized in Appendix C of this report.

### 2.2.4.4 Field Blanks

Field blanks were collected and submitted to the laboratory with the investigative samples and analyzed for the same parameters as the investigative samples. Field blanks consisted of distilled or de-ionized (DI) water which was poured over cleaned sampling equipment in between sample collections. Field blanks were collected unless dedicated sampling equipment was used to collect samples. Field blanks were analyzed to check for procedural contamination at the site which may have caused sample contamination.



#### 3.1 SAMPLE DOCUMENTATION

Documentation of sample tracking is an important aspect of environmental investigations and is designed to maintain the sample integrity subsequent to sample collection.

The URS field crews were responsible for completing COC forms which described the sample identification, time of collection, sample matrix, analyses requested, preservatives (if required), and any additional comments. The COCs were placed in the coolers shipped to the laboratory. Upon receipt of the coolers, the laboratory reviewed each cooler and accompanying COCs. Copies of the completed COCs are presented in Appendix B.

The laboratory sent URS sample confirmations via e-mail. Some minor discrepancies were noted during the sample receipt. These issues were addressed immediately with the field manager and were corrected prior to the submittal of the data package. URS was contacted regarding an anomaly for samples received July 6, 2006. Sample vials were received by the laboratory for sample SA2-MW-4-D requesting pesticide and PCB analysis, this analysis was not requested on the COC for this sample. URS confirmed that sample SA2-MW-4-D was also to be analyzed for pesticides and PCBs. A trip blank with sample ID TB-15 was received by the laboratory on July 12, 2006 and was not listed on the COC. URS was contacted and confirmed the sample and VOC analysis was requested. No additional problems or discrepancies were noted. All issues listed above were resolved prior to analysis and did not impact project DQOs.



#### 4.1 LABORATORY PROCEDURES

The samples collected during the Supplemental Investigation were analyzed following USEPA methods as summarized below. The associated QC review and data validation summaries are provided in Appendix C, respectively. The laboratory provided, in various batches, documentation for the methods listed below, including sample preparation, sample tracking, and documentation controls.

The data reported by the laboratory were reviewed and qualified accordingly. The qualifiers assigned are listed in Table 4-1.

#### 4.1.1 **Volatile Organics**

VOC analysis were analyzed by (USEPA) Method 8260B (SW-846) and prepared by USEPA Methods 5030B (aqueous) and 5035 (soil). Method 8260B utilizes gas chromatography/mass spectrometry (GC/MS) for separation and detection, respectively.

#### 4.1.2 Semi-Volatile Organics

USEPA Method 8270C (SW-846) is a GC/MS method that was used for determining extractable base/neutral and acid compounds. Samples were prepared by following USEPA Method 3520C (aqueous) and 3550B (soil) and analyzed using Method 8270C.

#### 4.1.3 **Polychlorinated Biphenyls**

USEPA Method 680 is a GCMS method that was used for the determination of Polychlorinated biphenyls (PCBs). Samples were cleaned by USEPA Method 3640A. Samples were prepared by EPA 680-P-Liquid method.

#### 4.1.4 **Organochlorine Pesticides**

USEPA Method 8081A (SW-846) uses Gas Chromatography. This method was used for the determination of Pesticides. The samples were prepared using USEPA Method 3550B (soil) and 3520C (aqueous).

#### 4.1.5 Herbicides

USEPA Method 8151A uses Gas Chromatography. This method was used for the determination of Herbicides. The samples were prepared using USEPA Method 8151A (soil and aqueous).



#### 4.1.6 Metals

USEPA Method 6010B by inductively coupled plasma-atomic emission spectrometry (ICP-AES) was used for the determination of metals. The samples were prepared using USEPA Methods 3050B (soil) and 3005A (aqueous). "Trace" ICP technology was used for all metals analysis except mercury. Samples were prepared and analyzed for mercury using Method 7470A (aqueous) and 7471A (soil).

#### 4.1.7 Nitrogen (Ammonia)

Methods for Chemical Analysis of Water and Wastes (MCAWW) Method 350.1 were used for the colorimetric determination of ammonia. Samples were prepared using EPA Method 3-154.

### Dioxins/Furans

USEPA Method 8290 was used for the determination of Dioxins. Samples were prepared as outlined in the respective method. Method 8290 utilizes high resolution GC and high resolution MS.

#### **Monitored Natural Attenuation Parameters** 4.1.8

Selected groundwater samples had monitored natural attenuation (MNA) parameters tested using the following methods:

- Nitrogen, Nitrate-Nitrite using Method 353.2
- Alkalinity and Carbon Dioxide using Method 310.1
- Sulfate using Method 375.4
- Chloride using Method 325.2
- Total Organic Carbon using Method 9060
- Dissolved Gases in Water using Robert S. Kerr (RSK) laboratory Method 175.

#### 4.2 LABORATORY QA/QC SAMPLES

#### 4.2.1 Method or Preparation Blank

The method or preparation blank for the analysis consisted of organic-free water. The blank was carried through each step of the analytical method, from extraction to analysis. The method and preparation blank data were used to evaluate potential contamination contributed to sample preparation and analysis during normal laboratory operations.



#### 4.2.2 **Surrogate Spikes**

Surrogate spikes are compounds added to every blank, sample, matrix spike, matrix spike duplicate, and standard when specified in the analytical methodology. The results are utilized to evaluate the accuracy of analytical measurements on a sample-specific basis. Surrogates are generally brominated, fluorinated, or isotopically labeled compounds not expected to be present in environmental media. Results are expressed as percent recovery (%R) of the surrogate spike. Recoveries outside of criteria can indicate evidence of matrix interference or problems with internal standards.

#### 4.2.3 **Laboratory Control Samples**

Laboratory control samples (LCS) are well-characterized, laboratory-generated samples and are used to monitor the laboratory's day-to-day performance of analytical methods. The organics LCS limits are based on  $\pm$  three sigma and are updated every six months. Inorganic LCS limits are based on a prescribed set of limits with each standard lot. LCSs are used to monitor the precision and accuracy of the analytical process independent of matrix effects. In some instances, the LCS is used to identify any background interference or contamination of the analytical system, which may lead to the reporting of elevated concentration levels or false positive results. The results of the LCS are compared to well-defined evaluation criteria to determine whether the laboratory system is "in control." Controlling laboratory operations with LCS, rather than surrogates or MS/MSD, offers the advantage of being able to differentiate low recoveries due to procedural errors from those due to matrix effects.

#### Matrix Spike/Matrix Spike Duplicates 4.2.4

MS/MSD samples are used to evaluate accuracy and precision using matrix as an indicator for organic and inorganic analyses. Organics MS/MSD limits are based on ± three sigma and are updated every six months. Inorganic MS/MSD limits are based on a prescribed set of limits with each standard lot. The laboratory analyzes MS/MSD samples with each analytical batch. MS/MSD criteria are established from either historical laboratory limits or those values identified in USEPA SW-846 methodology.

#### 4.2.5 **Internal Standards Performance**

Internal standards, which are compounds not found in environmental samples, are spiked into blanks, samples, MS/MSDs, and LCSs at the time of sample preparation. Internal standards for polychlorinated dibenzodioxin (PCDD) and polychlorinated dibenzofuran (PCDF) analyses are used to quantitate target compounds and to correct for variability of sample preparation, cleanup,



and analysis with respect to individual sample matrices. Internal standards must meet retention time and performance criteria specified in the analytical method or the sample would have been reanalyzed.



Section 5

The data review process, which involved a review of the laboratory summary data, was implemented to assess the quality of data resulting from the field sampling program with respect to the quality assurance objectives established for the project. In order to evaluate the appropriate usage of the data, in supporting decisions to be made, the data was evaluated with respect to data quality, major data uses, and the remedial decision to be made. Data that did not meet the criteria were qualified or discussed for the limitation on usability. In addition, approximately 10 percent of the data underwent a more comprehensive evaluation which included the review of raw data (i.e., chromatograms, run logs, etc.), recalculation of data, and sample tracking. For the purpose of this document, this extended review was termed full validation.

The following sections summarize the data review and data validation approach used for the Sauget A2 samples. In general, the review and validation followed guidance as presented in USEPA Contract Laboratory Program (CLP) National Functional Guidelines for Organic Data Review (USEPA 1999) and Inorganic Data Review (USEPA 2004), as applicable to SW-846 analytical methods and method-specific criteria. As indicated above, the data review involved reviewing QC summary forms, whereas the validation additionally involved the review of raw data. Table 3.1 of the Sauget A2 QAPP (URS 2004) summarizes the data review/validation criteria in tabular format. Professional judgment was used to determine appropriate actions and may not have necessarily followed the criteria outlined.

#### 5.1 DATA REVIEW/VALIDATION ELEMENTS

Analytical laboratory results were reviewed following guidance presented in USEPA CLP National Functional Guidelines for Organic Data Review (USEPA 1999) and USEPA CLP National Functional Guidelines for Inorganic Data Review (USEPA 2004). The data were reviewed/validated using the QC criteria specified in the Sauget A2 QAPP (URS 2004). These guidelines were used as applicable to SW-846 methods. Method-specific and established laboratory criteria were used for data assessment. Based on results of the data review/validation processes, sample data may have been qualified as J (estimated), UJ (estimated nondetects), U (nondetects), or R (rejected).

In accordance with these guidelines, professional judgment was used in certain areas to determine the need for data qualification. Professional judgment, as prescribed by the USEPA Functional Guidelines, involved a secondary evaluation of data with respect to qualifications. This took into account additional knowledge based on experience with laboratory practices,



analyte-specific factors such as chemical properties, and other current resolutions of technical issues addressed in the literature.

Although the data packages provided were not CLP deliverables, the CLP guidance was followed where applicable to SW-846 methodology. The QC elements reviewed in laboratory analytical data packages included the following:

- Completeness of the data package
- Laboratory case narrative and cooler receipt forms
- Compliance with required holding times and sample preservation
- Presence of analytes in method blanks and trip blanks
- Results of LCS
- Recoveries of surrogate spikes in samples
- Results of MS/MSD
- Recoveries of internal standards
- Field duplicate samples
- Serial dilution samples (metals only)
- Laboratory duplicate samples.

The data validation included all of the items identified above and additionally included the items below:

- Instrument performance check samples
- Run logs review
- Chromatograms review
- Initial calibration
- Calibration verifications (CV)
- Retention time windows
- Interference check samples (ICS) (ICP metals only)
- Analytical result verification.



When a result was above the method detection limit (MDL) and below the reporting limit, the laboratory flagged data J to indicate that the concentration reported is an estimated value. The data, including all post-analysis qualifiers, are presented in the data summary tables in Appendix A. The data review and validation results are presented in Appendix C.

The data review and validation procedures used to evaluate the Sauget A2 data are described in this section. The QC review details quality control issues associated with the analysis of the samples, describes if the data required qualification, and describes the use of professional judgment.

#### 5.1.1 Completeness of Data Package

Data packages were reviewed to make certain that they contained the data contractually required in the deliverable. This included checking the data package for the results of each analyte requested on each field sample submitted in the analytical batch, along with the requested QC documentation for the respective methods.

#### Sample Preservation and Holding Times 5.1.2

Sample holding times were calculated by subtracting the date of sampling, as determined from the COC forms, from the date of sample extraction/analysis. If the sample analysis was completed outside of the required holding times, data was qualified as estimated J (detects) or UJ (nondetects), or rejected R, depending on the severity of the exceeded holding time. The validation additionally included reviewing run logs and chromatograms to ensure the dates presented on the summary forms were accurate.

#### **Blanks** 5.1.3

Guidance provided in the USEPA CLP National Functional Guidelines for Organic and Inorganic Data Review was used for the evaluation of method blanks, preparation blanks, calibration blanks and trip blanks. If analytes were detected in a blank sample, but not in samples associated with the blank sample, then data was not qualified. If analytes were reported in a blank and in associated samples, the following actions were taken:

Positive sample results were reported without qualification when the concentration of the analyte in the sample exceeded 10 times (10x) the amount in a blank for common laboratory contaminants (methylene chloride, acetone, 2-butanone, bis(2-ethylhexyl) phthalate, di-n-butyl phthalate), or exceeded 5 times (5x) the amount in a blank for other compounds. Note: The 10x rule was only applied to method blank samples.



- When the sample results were greater than the reporting limit (RL), but less than the required multiple (5x or 10x) of the method blank result, sample results were qualified as nondetects U, and the RL was raised to the sample concentration.
- When the sample results were less than the RLs and less than the required multiple of the method blank result, sample results were qualified as nondetects U at the RL.
- If any analyte was reported in a blank sample and was reported in associated samples, the data was closely reviewed and qualified as necessary based on professional judgment.

During the data validation, the chromatograms were reviewed to ensure all peaks were identified and explained. In addition, extraction and run logs were reviewed to ensure a method or preparation blank was analyzed with each batch.

#### 5.1.4 Surrogates

Surrogates were used to assess accuracy for VOC, semi-volatile compounds (SVOCs), PCBs, pesticides, and herbicides analyses on a sample specific basis. Criteria for recovery of surrogate compounds spiked into samples are provided in Table 3.3 of the QAPP (URS 2004). For VOC, PCB, pesticide, and herbicide analyses, if any surrogate was out of specification due to recoveries greater than the upper evaluation limit, indicating a high bias, positive results for that sample were qualified as estimated **J**, and nondetects data were not qualified. If recoveries were below the lower evaluation limit, indicating a low bias, but greater than 10 percent, positive results for that sample were qualified as estimated J, and nondetects results were qualified as estimated UJ. For any surrogate recovery below 10 percent, positive results for that sample were qualified as estimated J, and nondetects results were qualified as rejected R. For SVOC analyses, the same approach was used except data were only qualified if two or more surrogate recoveries per fraction (acid, base/neutral) were outside criteria or any one surrogate compound recovery less than ten percent.

The validation additionally included recalculating the surrogate values from the raw data and reviewing the chromatograms to ensure the surrogate compounds were within the established retention time windows.

#### 5.1.5 **Laboratory Control Samples**

LCS is well characterized, laboratory-generated samples used to monitor the laboratory's day-today performance for inorganic and organic analyses, and to assess the accuracy and precision of the analytical process independent of matrix effects. Evaluation criteria for LCS are provided in



Appendix A of the QAPP (URS 2004). Sample results associated with a LCS recovery below the evaluation limit were qualified as estimated J (detects) or UJ (nondetects) based on a potential low bias. If LCS recoveries were less than half the lower evaluation limit, sample results reported as nondetects were qualified rejected R. Detected sample results associated with a LCS recovery above the evaluation limit were qualified as estimated J based on a potential high bias. Data reported as nondetects were not qualified based on a LCS with potential high bias.

The validation additionally included reviewing extraction and run logs to ensure a LCS was analyzed with each batch. Approximately 10 percent of the LCS recoveries were recalculated using the raw data. In addition, chromatograms were reviewed to ensure the LCS compounds were within the retention time windows.

#### 5.1.6 Matrix Spike/Matrix Spike Duplicate Samples

MS/MSD samples were analyzed for VOC, SVOC, pesticide, herbicide, metals, and wet chemistry parameter analyses. Evaluation criteria for accuracy (%R) and precision (Relative Percent Difference [RPD]) of the MS/MSD samples are provided in appendix of the QAPP (URS 2004). Per USEPA CLP National Functional Guidelines for Organic Data Review (USEPA 1999), no action was taken on organic MS/MSD data alone. MS/MSD data for organic methods were reviewed in conjunction with other QC parameters to determine if qualification was required. Samples analyzed for metals and wet chemistry parameters were qualified following USEPA CLP National Functional Guidelines for Inorganic Data Review (USEPA 2004).

In general, results for the sample on which the MS/MSD was prepared were qualified using the above guidelines. However using informed professional judgment, in conjunction with a review of the other QC criteria, the data reviewer may have determined the need for qualification of other sample data for the analytical batch from the site.

The validation additionally included reviewing extraction and run logs to ensure a MS/MSD was analyzed with each batch. Approximately 10 percent of the MS/MSD recoveries were recalculated using the raw data. Chromatograms from the organic analyses were also reviewed to ensure the MS/MSD compounds were within the retention time windows.

#### **Field Duplicate Samples** 5.1.7

Field duplicate samples were collected at a frequency of approximately 10 percent, as required by the Sauget A2 QAPP (URS 2004). RPDs were calculated for each field duplicate pair.



Precision evaluation criteria of 50 percent RPD for aqueous samples and criteria of 100 percent RPD for soil samples were considered if the analyte concentrations were greater than 5x the RL for both samples. For analytical results less than 5x the RL, for either or both samples, RPD evaluation criteria of  $\pm 2x$  the RL were utilized. Duplicate results were evaluated on a case-bycase basis to determine if qualification of data was necessary. Where it was determined that qualification of field duplicate samples was required, associated data were qualified J (detects) or **UJ** (nondetects).

#### 5.1.8 ICP Serial Dilution (Metals Data Review Only)

The serial dilution of samples quantified by ICP determines whether or not significant physical or chemical interference's exist due to sample matrix. The ICP serial dilution analysis is measured on one sample from each analytical batch or sample delivery group (SDG). A serial dilution of a sample with sufficiently high analyte concentrations (i.e. greater that a factor of 50 above the instrument detection limit (IDL) must agree within a 10 percent difference with the original analysis after correction for the dilution. If the 10 percent difference criteria are not met for analytes of sufficient concentration, then the associated data were qualified as estimated (J).

The following identifies additional parameters involved in the data validation that are not included in the data review.

#### 5.1.9 Instrument Performance Check (Data Validation Only)

The laboratory was required to analyze an instrument performance check sample every 12 hours of sample analysis. The instrument performance check sample summaries were compared to the method criteria. In addition, approximately 20 percent of the values were recalculated from the raw data. The laboratory was required to meet the method criteria prior to analyzing samples. If the laboratory did not meet the tuning criteria, the associated samples were qualified as R.

## 5.1.10 Preparation and Run Log Review (Data Validation Only)

Review of the preparation and run logs involved reviewing the logs to determine that samples were extracted and analyzed as presented on the sample summary forms. The preparation and sample run logs were reviewed to determine that the correct sample volume was prepared, the appropriate QC samples (e.g., LCS, MS...) were analyzed as part of the analytical batch, and the samples were analyzed in the method-required order.



## 5.1.11 Chromatogram Review (Data Validation Only)

This involved a review of each chromatogram to determine that peaks were within the acceptable retention time windows of the associated standard. The review also included comparing the analysis times presented on the instrument run logs to those presented on the sample chromatograms. In addition, the review identified all peaks present on the chromatogram as either: target analytes, internal standards, surrogates, or tentatively identified compounds.

# 5.1.12 Initial Calibration (Data Validation Only)

Each method required establishing an initial calibration curve. The data validation involved reviewing the percent relative standard deviations (%RSDs), the response factors (RFs) or the correlation coefficient ® if linear regression was employed. If %RSDs, RFs, or correlation coefficient ® were not met for an analyte, the associated data was qualified as J, UJ, or R, depending on the severity of the outlying data point. One analyte per internal standard was recalculated using the raw data.

## 5.1.13 Calibration Verification (Data Validation Only)

Each method required the analysis of CV samples to ensure the initial calibration was still valid. The data validation involved reviewing the %D of the RFs between the CV and the associated calibration curve. If the RF or %D criteria were not met for an analyte, the associated data was qualified as J, UJ, or R, depending on the severity of the outlying data. One analyte per internal standard, or 10 percent of the data presented on the continuing calibration summary forms, were recalculated using the raw data.

## 5.1.14 ICP Interference Check Sample (Metals Validation Only)

An ICP ICS verifies the laboratory's interelement and background correction factors. The ICS consists of two solutions, A and AB. Solution A consists of the interferents and solution AB consists of the target analytes mixed with the interferents. The ICS analysis consists of analyzing both solutions consecutively, starting with solution A for all wavelengths used for each analyte reported by ICP. The ICS is run at the beginning and end of each analytical batch, or a minimum of twice per 8-hour shift. The results of the ICS analysis of solution AB must fall within the control limits of +20% of the true value for the analytes included in the solution. For samples where the ICS analyte recoveries exceed the control limits, data were qualified as J, UJ, or R, depending on the severity of the outlying data. Additionally, one hundred percent of the analytes in the ICS were recalculated using the raw data.



#### 5.2 MEASUREMENT OF QUALITY ASSURANCE OBJECTIVES

The measurement of quality assurance was determined by the assessment of precision, accuracy, representativeness, completeness, comparability, and sensitivity (PARCCS). The PARCCS definitions are included below and the PARCCS assessments are included in Section 8.

#### 5.2.1 Precision

Precision is the measure of variability between individual sample measurements under prescribed conditions. Replicate measurements of known standards and the analysis of duplicate environmental samples assess precision. Evaluating the RPDs obtained from results of MSD, laboratory duplicate, and field duplicate samples assessed precision. The precision of the data is discussed in Section 8.

#### 5.2.2 Accuracy

Accuracy is the degree of agreement between the measurement of a known sample and an accepted reference or true value. Evaluating %Rs for LCS, MS samples, and surrogates assessed accuracy. The accuracy of the data is discussed in Section 8.

#### 5.2.3 Completeness

Following the QC review and validation of the data packages for the site, the data were assessed with respect to the fulfillment of QA objectives and usability. The completeness for laboratory analytical data for the site was calculated by the ratio of acceptable (including estimated data) analyses requested on the samples submitted for analysis, to the total number of analytical results requested.

The percent completeness, with respect to overall project objectives for the Sauget A2 project, was evaluated for the data required in making decisions on a case-by-case basis. In general, samples critical to the decision process required a 95 percent completeness goal.

#### 5.2.4 Representativeness

Representativeness is the degree to which data accurately and precisely represents a characteristic of a population, parameter variations at a sampling point, or an environmental condition. Representativeness is a parameter primarily concerned with the proper design of the



sampling program (such as sampling location strategy) or sub-sampling of a given sample. Assessment of representativeness includes an evaluation of precision. Therefore, reviewing the precision of field duplicate samples collected from a site can assess representativeness of the analytical results, with respect to the medium sampled. Review criteria for field duplicate analyses are identified in Section 5.1.7.

#### 5.2.5 Comparability

Comparability expresses qualitatively the confidence with which one data set can be compared to another. Data are comparable when collection techniques, measurement procedures, methods, and reporting are equivalent for all samples within the sample set. Section 8 contains a qualitative assessment of data comparability.

#### 5.2.6 Sensitivity

Sensitivity broadly describes the RL established to meet the project-specific DQOs. The sample RL is the lowest concentration of an analyte present in a sample that can be quantified with a specified level of confidence. The RLs are a function of the sample characteristics, MDLs, and laboratory performance.

MDLs are determined by the laboratory and defined as the level at which the laboratory can reliably quantify the concentration of an analyte on multiple analyses. The RLs are greater than the MDLs because MDL studies are performed using laboratory-prepared samples (spiked DI water); whereas, environmental samples are naturally more variable. United States Army Corps of Engineers (USACE) requires that RLs are 3-5 times the MDL. MDLs and RLs are provided in Tables 1.4B through 1.4D of the Sauget A2 QAPP (URS 2004). For this project, data are reported below the RLs as estimated J. Factors that may result in elevated RLs are discussed below.

- High concentrations of target or non-target analytes may require that the sample extract be diluted to avoid saturation of the detector, or to quantify the analyte concentration within the calibration range of the instrument. Consequently, RLs are elevated in proportion to the dilution factor.
- Matrix interference may require that the sample be diluted to reduce or eliminate the interference. Consequently, the RLs are elevated in proportion to the dilution factor.



- The physical characteristics of the matrix do not permit concentration to the required final volume during sample preparation, resulting in a larger sample extract volume and, consequently, an elevation in RLs.
- Matrix interference may require the RLs be elevated because of the inability to quantify data below the elevated RL.

In a given sample, one or more of these effects may be exhibited. When the RLs have been elevated as a result of one or more of the above causes, surrogate or target compounds present at low concentrations may not be detected. Therefore, elevated RLs may cause limitations to the application of the data for its intended use. These limitations on data for contaminants of concern are discussed on a case-by-case basis.

#### 5.3 DATA ASSESSMENT

The assessment of data involves the consideration of data uses, the identification of data which were qualified or otherwise deviated from the Sauget A2 QAPP requirements, and the limitations associated with the evaluation of data in supporting decisions to be made.

#### 5.3.1 **Summary of Data Quality Requirements**

Data collected in the corrective measures (CM) must be of known quality to support the uses for which it is intended. Data must meet the minimum quality standards to be useful in assessing the chemicals of concern, if any were released from the site, the acceptable level of uncertainty, and the concentrations in environmental media of concern at potential exposure points. Additionally, RLs must meet the levels necessary to determine whether analytes are present at concentrations of concern (i.e., above relative background concentrations, regulatory standards, or risk-based concentrations).

Inherent in providing defensible data is the need for a QA/QC program. The QA/QC program must have measurement tools so that data collected will be of known quality and legally defensible. QA/QC objectives for sampling and analysis were developed for this project which uses the following as indicators: precision, accuracy, completeness, comparability, representativeness, and sensitivity.

#### 5.3.2 **Data Usability Assessment**

A determination of data usability was made with respect to project DQOs. Sampling issues and data review/validation issues were discussed in terms of appropriateness of using the data as



intended, as well as making recommendations or limitations on data usage. These discussions address items such as elevated RLs, analytes suspected as laboratory contaminants, potential bias in results, and professional judgment utilized in the data review/validation. The data assessment summary is provided in Section 8 of this QCSR.



Section 6

**SECTIONSIX Data Reviews** 

The A2 sampling activities from May, 2006 to July, 2006 resulted in the collection of 51 groundwater samples, 19 soil samples, 15 trip blank samples and 3 field blank samples. The sample results were submitted in multiple SDGs and are noted SAS044 through SAS049. The Dioxin sample results were submitted in one sample delivery group and given a unique name, beginning with G6G, followed by a six digit number. The samples were identified for the following parameters VOCs, SVOCs, PCBs (including congeners), pesticides, herbicides, metals and wet chemistry parameters. All samples were sent to STL in Savannah, GA; with the exception of the Dioxins which were sent to STL in Sacramento, CA.

Appendix C contains the data quality reviews for all samples. The data quality reviews have been organized by SDGs and parameters.

### 6.1 DATA QUALITY REVIEW CHECKLISTS FOR ALL SDGS

SDGs were reviewed for each parameter separately. Appendix C contains the detailed review checklists for each parameter. In addition, a list of qualifiers for each SDG is provided at the end of the subsequent checklists for that SDG.



### 7.1 INTRODUCTION

Appendix C summarizes the full validation reports for ten percent of the chemical data for samples collected during the 2005 Sauget A2 field effort. The validation was completed in accordance with USEPA CLP National Functional Guidelines for Organic Data Review (USEPA 1999) and Inorganic Data Review (USEPA 2004), where applicable to SW-846 Methods. Additionally, QA/QC criteria established in the QAPP (URS 2004) was used.

### 7.2 **LEVEL IV VALIDATION OF DATA**

SDGs were validated at a rate of ten percent for each parameter. Appendix C contains the detailed validation checklists from each parameter.



#### 8.1 **OVERALL DATA ASSESSMENT**

Quality issues for the data were assessed to evaluate their affect on the major data uses. In general, the objective of the sampling event was to gather data sufficient to evaluate data usability in support of the supplemental Phase II investigation.

Based on the criteria outlined, all data have met the DQOs and should be accepted for their intended use with the exception of those data qualified as rejected ®.

Overall precision, assessed by the analysis of LCS/LCSD RPD and MS/MSD RPD, was approximately 99 percent. Overall accuracy, assessed by the analysis of LCS, LCSD, MS, MSD and surrogate compounds, was approximately 99 percent. Representativeness, assessed by the analysis of field blank samples and field duplicate samples was also acceptable. One hundred percent of the field duplicate results were within criteria. Completeness, defined as the percentage of usable data (data not qualified as R), was approximately 99.9 percent. Comparability was acceptable as samples were analyzed using the standard operating procedures throughout the project duration. Therefore, the overall PARCC parameters were acceptable. Sensitivity, and its impact on data usability, is included in the report.

#### 8.2 SAMPLING ISSUES

No sampling issues impacted data quality. Section 3 summarizes issues and documents that impact to the project DQO's.

### 8.3 DATA REVIEW/VALIDATION ISSUES

For laboratory analytical data, QA objectives were specified in the Sauget A2 QAPP (URS 2004). The QA objectives were used as indicators of the quality of data necessary to support identification and quantification of potential chemicals of concern. The data was reviewed and validated as identified in the QAPP (URS 2004). While the data review assessed the data based on the QC summary forms, the data validation was completed to determine if a more extensive review of the data indicated noncompliance with the method SOPs.

As presented in Appendix C, analytical results for some samples were qualified as UJ or J to indicate the quality control associated with that data did not meet evaluation criteria; however, they could be used for decision-making purposes. Analytical results were also qualified R could not be used for decision-making purposes. Analytical results were also qualified as U due to method blank, field blank, or trip blank contamination. Appendix C summarizes all



qualifications based on Data Quality Reviews and all qualifications based on Data Quality Validations.

### **APPROPRIATENESS** 8.4

Analytical methodologies identified in Section 4 were utilized to help determine the presence of any chemicals of concern. With respect to the site description, the analytical methods utilized were appropriate to assess all chemicals of concern.

### 8.5 **LIMITATIONS**

Limitations occur when reporting limits have been elevated above the decision point, data were detected below reporting limits (resulting in estimated data), or when data were rejected. The summary of analytical data presented in Appendix A identifies the reporting limits for each sample analysis, and the qualifications associated with the data. The only limitations were the results flagged as rejected (R), these results were not used for decision-making purposes. Table 6-8 summarizes all qualifications to the data based on the data review and validation procedures.



**SECTIONNINE** 

- U.S. Environmental Protection Agency (USEPA). 2005. Test Methods for Evaluating Solid Waste Physical/Chemical Methods. SW846. Third Edition. Final Update IIIB.
- U.S. Environmental Protection Agency (USEPA). 1999. National Functional Guidelines for Organic Data Review. USEPA Contract Laboratory Program. EPA 540/R-9/008. October.
- U.S. Environmental Protection Agency (USEPA). 2004. National Functional Guidelines for Inorganic Data Review. USEPA Contract Laboratory Program. EPA 540/R/01/008. July.





TABLE 1-1
Summary of Collected Samples Sauget Area 2

					Dioxins/Furans (SW8290)			81A)	35 (680)	(\$1A)	(6010B)	Methane, Ethane, Ethene (RSK-175)	0.1)	le (310.1)	Vitrogen, Nitrate-Nitrite (353.2)		.2)	Mercury (7470A/7471A)	Total Organic Carbon (9060)	0.1)
		Sample	Sample		ins/Furar	VOC (8260B)	SVOC (8270C)	Pesticides (8081A)	PCB Homologs (680)	Herbicides (8151A)	Metals, Total (6010B)	ıane, Ethi	Alkalinity (310.1)	Carbon dioxide (310.1)	gen, Nitr	Sulfate (375.4)	Chloride (325.2)	cury (747)	l Organic	Ammonia (350.1)
SDG	Sample ID	Date	Time	Matrix	Diox	۸٥۷	3vo	Pesti	S S	Hert	Meta	Met	41ka	art	Zi t	Sulfa	Chlo	Mer	rota.	E
SAS044	SOIL-Q-21-SS-0.5'	5/3/06	1340	Soil		х	X			X	x		,					х		x
SAS044	SOIL-Q-21-SB-4'	5/3/06	1400	Soil	<u> </u>	х	х			х	х							х		х.
SAS044	TB-1	5/3/06	0000	Water	<u> </u>	X	<del> </del>	<u> </u>	├	-	-	-		<u> </u>		-		-		
SAS044 SAS044	NAPL-C-31 NAPL-C-139	5/8/06 5/8/06	1050 1420	Soil Soil		x	x		$\vdash$	-	-	$\vdash$		$\vdash$	<u> </u>	$\vdash$		$\vdash$	×	<del> </del>
SAS044 SAS044	TB-2	5/8/06	0000	Water	_	x	<u> </u>	<del>                                     </del>	<del> </del>	-	$\vdash$	$\vdash$		$\vdash$	-				<u> </u>	ļ
SAS044	NAPL-B-34	5/9/06	1250	Soil		х	х												х	
SAS044	NAPL-B-139	5/9/06	1510	Soil	$\vdash$	х	х		<u> </u>	L									х	
SAS044	TB-3	5/9/06	0000	Water	<u> </u>	х			ļ							_		$\vdash$		
SAS044 SAS044	NAPL-A-40 NAPL-A-138	5/10/06 5/10/06	940 1310	Soil Soil	<del> </del>	x	×	<del>  -  </del>		<u> </u>	-	$\vdash$		$\vdash$		$\vdash$		$\vdash$	x	$\vdash$
SAS044	TB-4	5/10/06	0000	Water		- <u>^</u> -	<u> </u>	-							_					$\vdash$
SAS045	NAPL-A-(75-80)	5/15/06	850	Soil															х	
SAS045	NAPL-A-(95-100)	5/15/06	950	Soil															x	
SAS045	NAPL-A-(105-110)	5/15/06	1030	Soil	<u> </u>			ļ	<u> </u>	_									_x	
SAS045 SAS045	NAPL-B-(20-25) NAPL-B-(80-85)	5/16/06 5/16/06	830 1003	Soil Soil					<u> </u>	-		-			-				x	$\vdash$
SAS045	NAPL-B-(110-115)	5/16/06	1035	Soil			<del> </del>								_	$\vdash$			_ <u>x</u>	$\vdash$
SAS045	NAPL-B-138	5/16/06	1120	Soil		х	х												x	
SAS045	NAPL-C-31-D	5/17/06	910	Soil	L	х	х			$\Box$									х	
SAS045	NAPL-C-(20-25)	5/17/06	847	Soil	<u> </u>											$\Box$			<u>x</u>	ш
SAS045 SAS045	NAPL-C-(65-70) NAPL-C-(100-105)	5/17/06 5/17/06	1030	Soil Soil	-			<del> </del>									_		_x	$\vdash \vdash \vdash$
SAS045	TB-4	5/17/06	0000	Water		x	<u> </u>		<del> </del>										_ <u>x</u>	$\vdash$
SAS046	OSAA-1-26	6/2/06	850	Groundwater		х	х			х	х									x
SAS046	OSAA-1-46	6/2/06	950	Groundwater		х	х			х	х									х
SAS046	OSAA-1-66	6/2/06	1100	Groundwater	<u></u>	х.	X	<u> </u>		х	х							$\Box$		×
SAS046 SAS046	OSAA-1-86 TB-6	6/2/06 6/2/06	0000	Groundwater Water		X	х			Х	_ x									X
SAS046	OSAA-1-106	6/2/06	1410	Groundwater		x	x			x	×		-1		-					x
SAS046	UAA-11-22	6/5/06	950	Groundwater		х	х			- X	x									x
SAS046	UAA-11-42	6/5/06	1115	Groundwater		х	x			х	х									х
SAS046	UAA-11-62	6/5/06	1315	Groundwater		х	_ x	$\vdash$	$\vdash$	х	_ x									х
SAS046 SAS046	UAA-11-62-D TB-7	6/5/06 6/5/06	1315 0000	Groundwater Water		x	X			х	X									х
	UAA-11-82	6/5/06	1445	Groundwater		x	x	$\vdash$	$\vdash$	х	х				$\neg$		$\dashv$			x
SAS046	UAA-11-102	6/5/06	1610	Groundwater		х	х			х	x									x
SAS046	AA-P-10-22	6/6/06	1030	Groundwater		х	х			×	х				$\Box$					х
SAS046	AA-P-10-42	6/6/06	1130	Groundwater Groundwater		<u>x</u>	X			<u>x</u>	_ <u>x</u>			_						х
SAS046 SAS046	AA-P-10-62 TB-8	6/6/06 6/6/06	1405 0000	Water		x x	x	$\vdash$		×	х .			$\dashv$	$\dashv$					х_
SAS046	AA-P-10-82	6/6/06	1510	Groundwater		×	х	$\vdash$		×	×	-	$\dashv$							x
SAS046	AA-P-10-102	6/7/06	840	Groundwater		х	х			х	х									Х
SAS046	AA-P-10-102-D	6/7/06	840	Groundwater		х	х			х	х	$\Box$	$\Box$			$\Box$	$\Box$	$\Box$		х
SAS046	AA-P-10-118.5	6/7/06	1045	Groundwater		X	х .			_ <u>×</u>	_x						_			_x
SAS047 SAS047	SA2-MW-1-D TB-9	6/28/06 6/28/06	0000	Groundwater Water		x x	х			Х.	- X	×	х	×	- <del>x</del>	х	x	х	_x	x
SAS048	SA2-MW-4-D	7/5/06	1459	Groundwater		x	x	х	x	×	x	х	x	x	×	x	×	×	x	x
SAS048	SA2-MW-1-M	7/5/06	940	Groundwater		х	х			x	x	x	x	<u>x</u>	x	X	x	x	x	x
SAS048	SA2-MW-I-M-D	7/5/06	940	Groundwater		х	х			х	х	х	х	х	х	х	х	х	х	х
SAS048	SA2-MW-1-S	7/5/06	1155	Groundwater		×	_ x			_x	_x	х	х	х	x	x	x	x	х	х
SAS048 SAS048	TB-10 SA2-MW-2-M	7/5/06 7/5/06	0000 1510	Water Groundwater	$\dashv$	x x	<del>-</del>			<del>  </del>	<del>-                                    </del>	<del>-</del> -	<del>.  </del>	┯┥	٠	٠	٠ŀ	<del>-</del>	<del>-</del> -	<del>_</del>
SAS048 SAS048	TB-11	7/6/06	0000	Water	$\dashv$	x	_ x			×	_X	х	×	х	- <u>×</u>	х	X	×	х	×
SAS048	SA2-MW-2-D	7/6/06	1005	Groundwater		х	х	_		x	_ x	x	х	х	x	х	х	х	x	х
SAS048	SA2-MW-2-S	7/6/06	1330	Groundwater		х	х			х	х	х	х	х	х	х	х	х	х	х
SAS048	SA2-MW-8-D	7/6/06	1600	Groundwater		_x	х			×	×	х	х	х	х	х	х	х	x	х
SAS048	SA2-MW-4-M	7/6/06	945	Groundwater		_х	x		1	х.	_ x	х	х	х	_x_	х	х	x l	_х	x

TABLE 1-1
Summary of Collected Samples Sauget Area 2

SDG	Sample ID	Sample Date	Sample Time	Matrix	Dioxins/Furans (SW8290)	VOC (8260B)	SVOC (8270C)	Pesticides (8081A)	PCB Homologs (680)	Herbicides (8151A)	Metals, Total (6010B)	Methane, Ethane, Ethene (RSK-175)	Alkalinity (310:1)	Carbon dioxide (310.1)	Nitrogen, Nitrate-Nitrite (353.2)	Sulfate (375.4)	Chloride (325.2)	Mercury (7470A/7471A)	Total Organic Carbon (9060)	Ammonia (350.1)
SAS048	SA2-MW-4-S	7/6/06	1345	Groundwater		х	х			х	х	х	х	х	х	х	x	х	х	x
SAS048	SA2-MW-3M-FB	7/6/06	1550	Water		x	x		L	х	х	L			L			<u> </u>		x
SAS048	SA2-MW-10M-FB	7/6/06	1535	Water		_ x	x	<u> </u>	L	х	х	<u> </u>								x
SAS048	SA2-MW-3-M	7/7/06	855	Groundwater		х	x	<u> </u>		х	х	х	x	x	x	х	х	×	x	L X
SAS048	SA2-MW-3-S	7/7/06	1110	Groundwater	ļ	х	x	L		х	х	х	x	x	х	х	х	х	х	X
SAS048	SA2-MW-3-S-D	7/7/06	1110	Groundwater		х	x			х	х	х	_x	х.	x	х	х	х	х	X
SAS048	SA2-MW-3-D	7/7/06	1415	Groundwater		х	х	<u> </u>	ļ	х	х	х	x	х.	×	х	х	x	x	X
SAS048	SA2-MW-10M	7/7/06	900	Groundwater	L	х	х	ļ		х	х	х	x	X	x	х	х	х	х	x
SAS048	SA2-MW-10D	7/7/06	920	Groundwater		х	×		L	х	x	х	х	x	x	х	x	x	x	X
SAS048	SA2-MW-10S	7/7/06	1120	Groundwater		х	x	ļ	ļ	х	х	х	х	_x	x	х	х	x	х	X
SAS048	TB-12	7/7/06	0000	Water	L	х	ļ	ļ	ļ			L						<u> </u>	<u> </u>	Ш
SAS049	TB-13	7/10/06	0000	Water		х	ļ	ļ	I			L						<u> </u>		Ш
SAS049_	SA2-MW-6-M	7/10/06	1030	Groundwater		х	x			х	х	х	х	x	х	х	х	х	х	X.
SAS049	SA2-MW-6-M-DUP	7/10/06	1030	Groundwater		х	X			х	х	х	х	×	X	х	х	х	х	x
SAS049	SA2-MW-6-D	7/10/06	1500	Groundwater		х	x			х	х	х	х	х	x	х	х	x	х	х
SAS049	SA2-MW-9-D	7/10/06	950	Groundwater		X	×		L	x	х	х	X	x	х	х	х	x	х	X
SAS049	SA2-MW-9-D-D	7/10/06	950	Groundwater		х	x		ļ	х	х	х	x	х	х	х	х	×	х	х
SAS049	SA2-MW-9-M	7/10/06	1430	Groundwater		x	X			х	х	х	х	X	x	х	х	x	х	х
SAS049	SA2-MW-9-S	7/10/06	1540	Groundwater		х	х		<b></b>			х			_			<u> </u>		Ш
SAS049	SA2-MW-5-D	7/11/06	1030	Groundwater		х	х		ļ	х	х	х	Х	х	х	х	х	x	х	X.
SAS049	SA2-MW-5-S	7/11/06	1232	Groundwater		х	х			х	х	х	X	×	х	х	х	х	x	×
SAS049	SA2-MW-5-M	7/11/06 7/11/06	1530	Groundwater		х	х			х	х	х	Х	х	х	х	x	х	х	X
SAS049	TB-14 SA2-MW-9-S	7/11/06	930	Water		х				$\vdash$		<u> </u>								$\vdash$
SAS049 SAS049	SA2-MW-7-M-FB	7/11/06	1125	Groundwater Water			<del></del>	-	-	Х			<del> </del>		-			-		<del>     </del>
SAS049 SAS049	SA2-MW-7-M-FB	7/11/06	1435	Groundwater		X	X		-	X	X	X	X	X	X	X	X	X	X	X
SAS049 SAS049	SA2-MW-7-D	7/11/06	1600	Groundwater		x	X X		<del>                                     </del>	x	X	x	x	X	x	x	X	X	X	X
SAS049 SAS049	TB-15	7/11/06	0000	Water		X		$\vdash$			х	_ <u>^                                   </u>	-^-	х		^	х	х	X	X
SAS049 SAS049	SA2-MW-9-S	7/12/06	1010	Groundwater					-	$\vdash$	x		х	х	x	х	х	х	х	x
G6G070273	SA2-MW-4-D	7/5/06	1459	Groundwater	×					$\vdash$	^				<u> </u>	^	^	_	^	$\vdash$
G6G070273	SA2-MW-4-M	7/6/06	945	Groundwater	x				-		_					-	$\overline{}$			$\vdash$
G6G070273	SA2-MW-4-S	7/6/06	1345	Groundwater	×				Ι	-			-		-			$\vdash$		$\vdash$

TAb 2-1
Summary of Field Duplicate Samples Sauget Area 2

			Sample	Sample		C (8260B)	OC (8270C)	Herbicides (8151A)	Metals, Total (6010B)	Methane, Ethane, Ethene (RSK-175)	alinity (310.1)	rbon dioxide (310.1)	rogen, Nitrate-Nitrite (353.2)	ulfate (375.4)	bloride (325.2)	rcury, Total (7470A/7471A)	tal Organic Carbon (9060)	mmonia (350.1)
SDG	Parent Sample ID	Duplicate Sample ID	Date	Time	Matrix	ook	0AS	Не	Me	Me	Aik	Ca	Z.	Sul	ű	Ž	Ţ.	Ψ
SDG SAS046	Parent Sample ID UAA-11-62	Duplicate Sample ID UAA-11-62-D	Date 6/5/06	Time 1315	Matrix Groundwater		× SV	× He	×	Me	1IV	Ca	ž	Sul	ਹੈ ਹੈ	W	<u>5</u>	X
						х		_		Me	แฟ	Ca	Ž	Sal	ਹੈ ਹ	Ň	To	< <
SAS046	UAA-11-62	UAA-11-62-D	6/5/06	1315	Groundwater	X	X	х	х	×	11V ×	×	X	x	ਹੈ ×	X	ž X	X
SAS046 SAS046	UAA-11-62 AA-P-10-102	UAA-11-62-D AA-P-10-102-D	6/5/06 6/7/06	1315 840	Groundwater Groundwater	X X X	X X	x x	X X		<b>H</b>	C	-	S	O -	X X	T.	X X
SAS046 SAS046 SAS048	UAA-11-62 AA-P-10-102 SA2-MW-1-M	UAA-11-62-D AA-P-10-102-D SA2-MW-1-M-D	6/5/06 6/7/06 7/5/06	1315 840 940	Groundwater Groundwater Groundwater	X X X	x x x	x x x	x x x	x	Y X	C	X	×	X	+	န x	X X X

TABLE 4-1

## Data Review/Validation Qualifier Codes

	GC/MS Organics		GC and HPLC,Organics		Inorganics and Conventionals
Code	Interpretation	Code	A CONTROL OF CONTROL AND STATE OF THE SAME AND	Code	Interpretation
3 <b>a</b>	Incorrect or incomplete analytical sequence	a	Incorrect or incomplete analytical sequence	2	Incorrect or incomplete analytical sequence
c	Calibration failure, poor (RRF) or unstable (%D) response	b	Instrument performance failure or poor chromatography	c	Calibration failure
d.	MS/MSD or LCS/LCSD RPD imprecision	C	Calibration failure; poor or unstable (%D) response	d	MSIMSD or LCSILCSD RPD imprecision
<b>.e</b>	Sample preservation or cooler temperature failure	ď	MS/MSD or LCS/LCSD RPD imprecision	e.	Sample preservatmon or cooler temperature failure
***	Field duplicate imprecision		Sample preservation or cooler temperature failure		Field duplicate imprecision
h	Holding time violation	ſ	Field duplicate imprecision	h.	Holding time violation
	Tuning Failure or poor mass spectrometer performance	g	Dual column confirmation imprecision	, k.,	Laboratory duplicate imprecision
	LCS recovery failure	'n,	Holding time violation	20%	LCS recovery failure
m	MS/MSD recovery failure	NO.	LCS recovery failure	m	MS/MSD recovery failure
n 🔩	Internal standard failure	m	MS/MSD recovery failure	30	ICP interference check sample failure
p*	Air bubble (> 6 mm or ¼ inch) in VOC vials	þ	Air bubble (>6 mm or 1/4 inch) in VOC vials	0.	Calibration blank contamination
q	Concentration exceeded the linear range	Ž(q	Concentration exceeded the linear range	p	Preparation blank contamination
<b>.</b>	linearity (%RSD or r) failure in initial calibration	<b>. 'r</b> '	Linearity (%RSD or r) failure in initial calibration	ją,	Concentration exceeded the linear range
3.5	Surrogate failure	<b>S</b> 3	Surrogate failure	S.	Linearity failure in calibration or MSA
1.	Tentatively identified Compound	u	No confirmation column	1.8	Serial dilution failure
W.	Identification criteria failure	w	Identification criteria failure	V	Post-digestion spike failure
	Field and/or equipment blank contamination	" Whilliam But	Field and/or equipment blank contamination	ŵ	CRDL standard recovery failure
<b>y</b> ,	Trip blank contamination	S.Y.	Trip blank contamination	X	Field and/or equipment blank contamination
z	Method blank and/or storage blank contamination	Z	Method blank and/or storage blank contamination	Z	
Q	Other — see bottom of data report for explanation	, Q	Other — see bottom of data report for explanation	Q	Other - see bottom of data report for explanation

The reason code indicates the type of quality control failure that lead to the application of the data validation flag.

TABLE 6-1
Summary of Qualifications for SDG SAS044

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS044	NAPL-C-139	VOCs	Chloromethane	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromomethane	UJ	S	<del></del>
SAS044	NAPL-C-139	VOCs	Vinyl chloride	ÜJ	S	<u> </u>
SAS044	NAPL-C-139	VOCs	Chloroethane	UJ	S	<del>                                     </del>
SAS044	NAPL-C-139	VOCs	Methylene chloride	UJ	S	<del> </del>
SAS044	NAPL-C-139	VOCs	Carbon disulfide	J	S	1
SAS044 SAS044	NAPL-C-139	VOCs	1,1-Dichloroethene	UJ	S	+
	NAPL-C-139	VOCs	1,1-Dichloroethane	UJ	S	+
SAS044			cis-1,2-Dichloroethene	UJ		<del> </del>
SAS044	NAPL-C-139	VOCs			S	1
SAS044	NAPL-C-139	VOCs	trans-1,2-Dichloroethene	UJ	S	ļ
SAS044	NAPL-C-139	VOCs	Chloroform	UJ	S	
SAS044	NAPL-C-139	VOCs	1,2-Dichloroethane	ບງ	S	<b>.</b>
SAS044	NAPL-C-139	VOCs	1,1,1-Trichloroethane	UJ	S	ļ
SAS044	NAPL-C-139	VOCs	Carbon tetrachloride	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromodichloromethane	UJ	S	
SAS044	NAPL-C-139	VOCs	1,1,2,2-Tetrachloroethane	UJ	S	
SAS044	NAPL-C-139	VOCs	1,2-Dichloropropane	UJ	S	
SAS044	NAPL-C-139	VOCs	trans-1,3-Dichloropropene	UJ	S	
SAS044	NAPL-C-139	VOCs	trichloroethene	UJ	S	
SAS044	NAPL-C-139	VOCs	Dibromochloromethane	UJ	S	
SAS044	NAPL-C-139	VOCs	cis-1,3-Dichloropropene	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromoform	UJ	S	
SAS044	NAPL-C-139	VOCs	2-Hexanone	UJ	S	
SAS044	NAPL-C-139	VOCs	4-Methyl-2-pentanone	UJ	S	<del> </del>
SAS044	NAPL-C-139	VOCs	Tetrachloroethene	UJ	S	1
SAS044	NAPL-C-139	VOCs	Chlorobenzene		S	<del>                                     </del>
SAS044	NAPL-C-139	VOCs	Styrene	ÜJ	S	1
SAS044	Soil-Q-21-SB-4'	SVOCs	2.4-Dinitrotoluene	UJ	C	1
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,4-Dinitrotoluene	UJ	C	
SAS044	NAPL-C-31	SVOCs	2,4-Dinitrotoluene	ເປ	C	+
SAS044	NAPL-C-139	SVOCs	2,4-Dinitrotoluene	UJ	C	+
SAS044	NAPL-B-34	SVOCs	2,4-Dinitrotoluene	UJ	C	<del> </del>
SAS044	NAPL-B-139	SVOCs	2,4-Dinitrotoluene	UJ	C	
SAS044 SAS044	NAPL-A-40	SVOCs	2,4-Dinitrotoluene	UJ	С	
						<b>+</b>
SAS044	NAPL-A-138	SVOCs	2.4-Dinitrotoluene	UJ	C	-
SAS044	Soil-Q-21-SB-4'	SVOCs	2,6-Dinitrotoluene	UJ	C	ļ
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,6-Dinitrotoluene	· UJ	C	
SAS044	NAPL-C-31	SVOCs	2,6-Dinitrotoluene	UJ	C	ļ
SAS044	NAPL-C-139	SVOCs	2,6-Dinitrotoluene	. UJ	С	ļ
SAS044	NAPL-B-34	SVOCs	2,6-Dinitrotoluene	UJ	C	ļ. i
SAS044	NAPL-B-139	SVOCs	2,6-Dinitrotoluene	UJ	C	ļ
SAS044	NAPL-A-40	SVOCs	2,6-Dinitrotoluene	UJ	C	ļ
SAS044	NAPL-A-138	SVOCs	2,6-Dinitrotoluene	UJ_	C	<b> </b>
SAS044	Soil-Q-21-SB-4'	SVOCs	4,6-Dinitro-2-methylphenol	UJ	<u>C</u>	ļ
SAS044	Soil-Q-21-SS-0.5	SVOCs	4,6-Dinitro-2-methylphenol	UJ	С	
SAS044	NAPL-C-31	SVOCs	4,6-Dinitro-2-methylphenol	UJ	C	
SAS044	NAPL-C-139	SVOCs	4,6-Dinitro-2-methylphenol	UJ	C	
SAS044	NAPL-B-34	SVOCs	4,6-Dinitro-2-methylphenol	UJ_	C	
SAS044	NAPL-B-139	SVOCs	4,6-Dinitro-2-methylphenol	UJ	С	
SAS044	NAPL-A-138	SVOCs	4,6-Dinitro-2-methylphenol	UJ	С	
SAS044	NAPL-A-40	SVOCs	4,6-Dinitro-2-methylphenol	R	C	
SAS044	NAPL-A-40	SVOCs	Benzo[k]fluoranthene	UJ	С	
SAS044	NAPL-A-40	SVOCs	Dinoseb	R	С	
SAS044	NAPL-A-40	SVOCs	Bis(2-ethylhexyl)phthalate	U	Z	
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,4-Dinitrophenol	. R	M	
SAS044	Soil-Q-21-SS-0.5	SVOCs	Pentachlorophenol	R	M	<del>                                     </del>
SAS044	Soil-Q-21-SS-0.5	Herbicides	MCPA	UJ	г	1
SAS044	Soil-Q-21-SB-4'	Herbicides	MCPA	UJ	r	<del>                                     </del>
SAS044	Soil-Q-21-SB-4'	Metals	Sodium	U		<del>  </del>
272044	Jour-4-7-20-4	ivictals	LSourain		p	<u>.                                    </u>

TABLE 6-1

	SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
1	SAS044	Soil-Q-21-SS-0.5	General Chemistry	Ammonia	J	m	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

11 = Non-detec

TABLE 6-2

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS045	NAPL-B-138	VOCs	Acetone	J	С	
SAS045	NAPL-B-138	VOCs	Carbon Disulfide	J	C·	
SAS045	NAPL-C-31-DDL	VOCs	Chlorobenzene	J	S	
SAS045	NAPL-B-138	SVOCs	Bis(2-ethylhexyl) phthalate	Ü	Z	
SAS045	NAPL-C-31-D	SVOCs	Bis(2-ethylhexyl) phthalate	U	Z	
SAS045	NAPL-B-138	SVOCs	2,4-Dinitrophenol	UJ	С	
SAS045	NAPL-C-31-D	SVOCs	Benzo(b)fluoranthene	UJ	С	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

Summary of Qualifications for SDG SAS046

**TABLE 6-3** 

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS046	OSAA-1-26	VOCs	Chloromethane	UJ	С	
SAS046	OSAA-1-26	VOCs	Bromomethane	UJ	С	
SAS046	OSAA-1-46	VOCs	Chloromethane	UJ	C	
SAS046	OSAA-1-46	VOCs	Bromomethane	UJ	C	
SAS046	OSAA-1-66	VOCs	Chloromethane	UJ	С	
SAS046	OSAA-1-66	VOCs	Bromomethane	UJ	С	
SAS046	OSAA-1-86	VOCs	Chloromethane	UJ	C	
SAS046	OSAA-1-86	VOCs	Bromomethane	UJ	С	
SAS046	OSAA-1-106	VOCs	Chloromethane	UJ	C	
SAS046	OSAA-1-106	VOCs	Bromomethane	UJ	С	
SAS046	UAA-11-22	VOCs	Chloromethane	UJ	С	
SAS046	UAA-11-22	VOCs	Bromomethane	UJ "	C	
SAS046	UAA-11-42	VOCs	Chloromethane	UJ	C	
SAS046	UAA-11-42	VOCs	Bromomethane	UJ	С	
SAS046	UAA-11-62	VOCs	Chloromethane	UJ	C	
SAS046	UAA-11-62	VOCs	Bromomethane	UJ	С	
SAS046	UAA-11-62-D	VOCs	Chloromethane	UJ	С	
SAS046	UAA-11-62-D	VOCs	Bromomethane	UJ	С	
SAS046	UAA-11-82	VOCs	Chloromethane	UJ	С	
SAS046	UAA-11-82	VOCs	Bromomethane	UJ	С	
SAS046	UAA-11-102	VOCs	Chloromethane	UJ	С	
SAS046	UAA-11-102	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-22	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-22	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-42	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-42	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-82	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-82	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-102	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-102	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-102-D	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-102-D	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-118.5	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-118.5	VOCs	Bromomethane	. UJ	С	
SAS046	OSAA-1-26	SVOCs	All SVOCs	UJ	Н	
SAS046	OSAA-1-46	SVOCs	All SVOCs	UJ	Н	
SAS046	OSAA-1-66	SVOCs	All SVOCs	UJ	Н	
SAS046	UAA-11-22	SVOCs	All nondetects	UJ	S	
SAS046	UAA-11-102	SVOCs	1,4-Dichlorobenzene	J	S	
SAS046	AA-P-10-42	Herbicides	Pentachlorophenol	R	m	
SAS046	OSAA-1-46	Metals	Beryllium	U	0	
SAS046	OSAA-1-86	Metals	Beryllium	U	0	
SAS046	OSAA-1-106	Metals	Beryllium	U	0	
SAS046	AA-P-10-62	Metals	Beryllium	U	0	
SAS046	AA-P-10-82	Metals	Beryllium	U	0	
SAS046	AA-P-10-102	Metals	Beryllium	U	0	
SAS046	AA-10-102-D	Metals	Beryllium	U	0	
SAS046	AA-P-10-118.5	Metals	Beryllium	U	0	
SAS046	All metals	Metals	Barium	J	n	
SAS046	All metals	Metals	Chromium	J	n	
SAS046	All metals	Metals	Manganese	J	n	
SAS046	All metals	Metals	Vanadium	J	n	
SAS046	All metals	Metals	Zinc	J	ת	
SAS046	AA-P-10-42	Metals	Aluminum	J	k	
SAS046	AA-P-10-42	Metals	Potassium	J	m	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

**TABLE 6-4** 

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS047	SA2-MW-1-D	VOCs	Acetone	UJ	С	
SAS047	SA2-MW-1-D	VOCs	2-butanone	UJ	C	
SAS047	SA2-MW-1-D	SVOCs	3-Nitroaniline	UJ	L	
SAS047	SA2-MW-1-D	SVOCs	3,3'-Dichlorobenzidine	R	L	
SAS047	SA2-MW-1-D	Metals	Chromium	U	0	
SAS047	SA2-MW-1-D	Metals	Copper	U	0	
SAS047	SA2-MW-1-D	Metals	Lead	UJ	0	
SAS047	SA2-MW-1-D	Metals	Potassium	J	s	]
SAS047	SA2-MW-1-D	Wet chemistry	Nitrate	UJ	h	
SAS047	SA2-MW-1-D	Wet chemistry	Nitrite	R	h	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

TABLE 6-5
Summary of Qualifications for SDG SAS048

op.c				URS		
SDG	Sample ID	Analysis	Analyte	Qual.	Code	New RL
SAS048	SA2-MW-4-D	VOCs	2-Butanone	UJ	С	
SAS048	SA2-MW-1-M	VOCs	2-Butanone	UJ	C	
SAS048	SA2-MW-1-M-D	VOCs	2-Butanone	UJ	С	
SAS048	SA2-MW-1-S	VOCs	2-Butanone	UJ	C.	
SAS048	SA2-MW-2-M	VOCs	2-Butanone	UJ	C	
SAS048	SA2-MW-2-D	VOCs	Bromomethane	UJ	C	<u> </u>
SAS048	SA2-MW-2-D	VOCs	2-Butanone	UJ	С	
SAS048	SA2-MW-2-D	VOCs	4-Methyl-2-Pentanone	UJ	С	
SAS048	SA2-MW-2-S	VOCs	Bromomethane	UJ	С	
SAS048	SA2-MW-2-S	VOCs	2-Butanone	נט	С	
SAS048	SA2-MW-2-S	VOCs	4-Methyl-2-Pentanone	UJ	C	
SAS048	SA2-MW-8-D	VOCs	Bromomethane	UJ	C	
SAS048	SA2-MW-8-D	VOCs	2-Butanone	UJ	C	ļ
SAS048	SA2-MW-8-D	VOCs	4-Methyl-2-Pentanone	UJ	С	
SAS048	SA2-MW-4-M	VOCs	Bromomethane	UJ	C	
SAS048	SA2-MW-4-M	VOCs	2-Butanone	U)	C	
SAS048	SA2-MW-4-M	VOCs	4-Methyl-2-Pentanone	UJ	C	ļ
SAS048	SA2-MW-4-S	VOCs	2-Butnaone	UJ	C	
SAS048	SA2-MW-4-S	VOCs	4-Methyl-2-Pentanone	UJ	С	<u> </u>
SAS048	SA2-MW-4-S	VOCs	Bromomethane	UJ	C	ļ
SAS048	SA2-MW-3-M	VOCs	2-Butnaone	UJ	C	
SAS048	SA2-MW-3-M	VOCs	4-Methyl-2-Pentanone	UJ	C	
SAS048	SA2-MW-3-M	VOCs	Bromomethane	UJ	C	+
SAS048	SA2-MW-3-S	VOCs	2-Butnaone	UJ	C	-
SAS048	SA2-MW-3-S	VOCs	4-Methyl-2-Pentanone	UJ		
SAS048	SA2-MW-3-S	VOCs	Bromomethane	UJ	C	<del> </del>
SAS048	SA2-MW-3-S-D	VOCs	2-Butnaone	UJ	C	<del> </del>
SAS048	SA2-MW-3-S-D SA2-MW-3-S-D	VOCs	4-Methyl-2-Pentanone	UJ		
SAS048 SAS048	SA2-MW-3-S-D SA2-MW-3-D	VOCs	Bromomethane	UJ	C	+
SAS048 SAS048	SA2-MW-3-D SA2-MW-3-D	VOCs VOCs	2-Butnaone 4-Methyl-2-Pentanone	UJ	$\frac{c}{c}$	
SAS048	SA2-MW-3-D	VOCs	Bromomethane	UJ	Ċ	<del> </del>
SAS048	SA2-MW-10M	VOCs	2-Butnaone	UJ UJ	c	
SAS048	SA2-MW-10M SA2-MW-10M	VOCs	4-Methyl-2-Pentanone	UJ	C	
SAS048	SA2-MW-10M	VOCs	Bromomethane	UJ	C	<del> </del>
SAS048	SA2-MW-10D	VOCs	2-Butnaone	UJ	C	<del>                                     </del>
SAS048	SA2-MW-10D	VOCs	4-Methyl-2-Pentanone	UJ	C	<del> </del>
SAS048	SA2-MW-10D	VOCs	Bromomethane	UJ	c	1
SAS048	SA2-MW-10S	VOCs	2-Butanone	UJ	C	<del>                                     </del>
SAS048	SA2-MW-10S	VOCs	4-Methyl-2-Pentanone	UJ	Č	
SAS048	SA2-MW-4-D	Pesticides	All Pesticides	UJ	s	
SAS048	SA2-MW-4-D	PCBs	All PCBs	UJ	1	<u> </u>
SAS048	SA2-MW-1-M	Metals	Chromium	U	0	1
SAS048	SA2-MW-1-M-D	Metals	Chromium	U	0	1
SAS048	SA2-MW-1-S	Metals	Copper	U	0	
SAS048	SA2-MW-2-M	Metals	Chromium	U	0	
SAS048	SA2-MW-2-S	Metals	Chromium	U	0	1
SAS048	SA2-MW-2-S	Metals	Copper	Ū	0	
SAS048	SA2-MW-8-D	Metals	Chromium	Ū	0	
SAS048	SA2-MW-4-M	Metals	Chromium	U	0	
SAS048	SA2-MW-4-S	Metals	Chromium	U	0	
SAS048	SA2-MW-3-M	Metals	Chromium	U	0	
SAS048	SA2-MW-3-S	Metals	Chromium	Ū	0	
SAS048	SA2-MW-3-S	Metals	Copper	υ	0	
SAS048	SA2-MW-3-S-D	Metals	Chromium	Ū	0	
SAS048	SA2-MW-3-S-D	Metals	Copper	Ü	0	
SAS048	SA2-MW-10M	Metals	Chromium	Ü	0	

**TABLE 6-5** 

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS048	SA2-MW-10D	Metals	Chromium	U	0	
SAS048	SA2-MW-10S	Metais	Copper	U	0	
SAS048	SA2-MW-10S	Metals	Chromium	U	0	
SAS048	SA2-MW-10S	Herbicides	Pentachlorophenol	R	m	
SAS048	SA2-MW-3-M	Wet chemistry	Total Organic Carbon	U	х	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

TABLE 6-6
Summary of Qualifications for SDG SAS049

SDG	Sample ID	Analysis	Analyte	URS Qual.	Code	New RL
SAS049	SA2-MW-9-S	VOCs	Carbon disulfide	J	L	
SAS049	SA2-MW-6-M	VOCs	Bromomethane	UJ	C	
SAS049	SA2-MW-6-M-Dup	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-6-D	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-9-D	VOCs	Bromomethane	UJ	С	l
SAS049	SA2-MW-9-D-D	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-9-M	VOCs	Bromomethane	UJ	С	I
SAS049	SA2-MW-9-S	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-5-D	VOCs	Bromomethane	UJ	C	
SAS049	SA2-MW-5-S	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-5-M	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-7-M	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-7-D	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-6-D	Metals	Aluminum	U	0	
SAS049	SA2-MW-9-D	Metals	Aluminum	U	0_	
SAS049	SA2-MW-9-D-D	Metals	Aluminum	U	0	
SAS049	SA2-MW-5-D	Metals	Aluminum	U	0	

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

### **TABLE 6-7**

# **Summary of Qualifications for SDG G6G070273**

SDG	Sample ID	Analysis	Analyte	URS Qual.	 New RL
G6G070273	No Qualifications				

Notes:

R = Rejected

J = Estimated

UJ = Estimated non-detect

TABLE 6-8
Summary of Qualifications for SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Analysis	Analyte	URS Qual	Code	New R
SAS044	NAPL-C-139	VOCs	Chloromethane	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromomethane	υj	S	
SAS044	NAPL-C-139	VOCs	Vinyl chloride	UJ	S	ļ
SAS044	NAPL-C-139	VOCs	Chloroethane	UJ	<u>s</u>	<b>⊢</b> —
SAS044	NAPL-C-139	VOCs	Methylene chloride	UJ	S	ļ
SAS044	NAPL-C-139	VOCs	Carbon disulfide	J	S	<u> </u>
SAS044	NAPL-C-139	VOCs	1,1-Dichloroethene	UJ	S	<u> </u>
SAS044	NAPL-C-139	VOCs	1,1-Dichloroethane	UJ	S	<u> </u>
SAS044	NAPL-C-139	VOCs	cis-1,2-Dichloroethene	UJ	S	<u> </u>
SAS044	NAPL-C-139	VOCs	trans-1,2-Dichloroethene	UJ	S	
SAS044	NAPL-C-139	VOCs	Chloroform	UJ	S	<u> </u>
SAS044	NAPL-C-139	VOCs	1,2-Dichloroethane	UJ	S	
SAS044	NAPL-C-139	VOCs	1,1,1-Trichloroethane	UJ	S	
SAS044	NAPL-C-139	VOCs	Carbon tetrachloride	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromodichloromethane	UJ	S	
SAS044	NAPL-C-139	VOCs	1,1,2,2-Tetrachloroethane	UJ	S	
SAS044	NAPL-C-139	VOCs	1,2-Dichloropropane	UJ	S	
SAS044	NAPL-C-139	VOCs	trans-I,3-Dichloropropene	UJ	S	
SAS044	NAPL-C-139	VOCs	trichloroethene	UJ	S	
SAS044	NAPL-C-139	VOCs	Dibromochloromethane	UJ	S	T
SAS044	NAPL-C-139	VOCs	cis-1,3-Dichloropropene	UJ	S	
SAS044	NAPL-C-139	VOCs	Bromoform	UJ .	S	
SAS044	NAPL-C-139	VOCs	2-Hexanone	IJ	S	
SAS044	NAPL-C-139	VOCs	4-Methyl-2-pentanone	נט	S	T
SAS044	NAPL-C-139	VOCs	Tetrachloroethene	ַנט	S	Γ
SAS044	NAPL-C-139	VOCs	Chlorobenzene	Ĵ	S	
SAS044	NAPL-C-139	VOCs	Styrene	UJ	S	
SAS044	Soil-Q-21-SB-4'	SVOCs	2,4-Dinitrotoluene	ເບ	C	
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,4-Dinitrotoluene	UJ	Ċ	
SAS044	NAPL-C-31	SVOCs	2,4-Dinitrotoluene	LU	Č	
SAS044	NAPL-C-139	SVOCs	2,4-Dinitrotoluene	UJ	c	
SAS044	NAPL-B-34	SVOCs	2,4-Dinitrotoluene	UJ	C	
SAS044	NAPL-B-139	SVOCs	2,4-Dinitrotoluene	UJ	C	
\$A\$044	NAPL-A-40	SVOCs	2.4-Dinitrotoluene	UJ	C	<del> </del>
SAS044	NAPL-A-138	SVOCs	2,4-Dinitrotoluene	UJ	c	
SAS044	Soil-Q-21-SB-4'	SVOCs	2,6-Dinitrotoluene	UJ	c	· · · · · ·
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,6-Dinitrotoluene	IJ	<u>c</u>	
SAS044	NAPL-C-31	SVOCs	2,6-Dinitrotoluene	UJ	<u>c</u>	
SAS044	NAPL-C-139	SVOCs	2,6-Dinitrotoluene	UJ	č	
\$A\$044	NAPL-B-34	SVOCs	2,6-Dinitrotoluene	Ωĵ	č	
SAS044	NAPL-B-139	SVOCs	2,6-Dinitrotoluene	UJ	c	
SAS044	NAPL-A-40	SVOCs	2,6-Dinitrotoluene	LU	C	<del></del>
SAS044	NAPL-A-138	SVOCs	2,6-Dinitrotoluene	UJ	c	
SAS044	Soil-Q-21-SB-4'	SVOCs	4,6-Dinitro-2-methylphenol	ĹŨ	C	<del>                                     </del>
SAS044	Soil-Q-21-SS-0.5	SVOCs	4,6-Dinitro-2-methylphenol	UJ	Č	· · · · · ·
SAS044	NAPL-C-31	SVOCs	4,6-Dinitro-2-methylphenol	· LÜ	C	
SAS044	NAPL-C-139	SVOCs	4,6-Dinitro-2-methylphenol	LU	<u>c</u>	
SAS044	NAPL-B-34	SVOCs	4,6-Dinitro-2-methylphenol	UJ UJ	C	
SAS044	NAPL-B-139	SVOCs	4,6-Dinitro-2-methylphenol	- ÜJ	<del>c</del>	
SAS044	NAPL-A-138	SVOCs	4,6-Dinitro-2-methylphenol	Ü	Č	
SAS044	NAPL-A-40	SVOCs	4,6-Dinitro-2-methylphenol	R	c	<del></del>
SAS044	NAPL-A-40	SVOCs	Benzo[k]fluoranthene	UJ	<u>c</u>	
SAS044	NAPL-A-40	SVOCs	Dinoseb	R	c	·
SAS044	NAPL-A-40	SVOCs	Bis(2-ethylhexyl)phthalate	Ü	Z	<del>                                     </del>
SAS044	Soil-Q-21-SS-0.5	SVOCs	2,4-Dinitrophenol	R	M	
SAS044	Soil-Q-21-SS-0.5	SVOCs	Pentachlorophenol	R	M	<del> </del>
SAS044	Soil-Q-21-SS-0.5	Herbicides	MCPA	LÜ	r	-
SAS044	Soil-Q-21-SB-4'	Herbicides	MCPA	UJ	<u> </u>	l
SAS044	Soil-Q-21-SB-4'	Metals	Sodium	Ü	p	<del></del>
SAS044 SAS044	Soil-Q-21-SS-0.5	General Chemistry	Ammonia	j	p m	<del> </del>
SAS044 SAS045	NAPL-B-138	VOCs	Acetone	<del>,</del>	C	<del> </del>
SAS045 SAS045	NAPL-B-138	VOCs	Carbon Disulfide	3		<del> </del>
SAS045	NAPL-C-31-DDL	VOCs	Chlorobenzene	,	S	<del>                                     </del>
SAS045	NAPL-B-138	SVOCs	Bis(2-ethylhexyl) phthalate	U		<del> </del>
SAS045	NAPL-D-136	SVOCs	Bis(2-ethylhexyl) phthalate	Ü	Z	<del> </del>
SAS045 SAS045	NAPL-C-31-D NAPL-B-138	SVOCs	2,4-Dinitrophenol	נט	C	<del> </del>
SAS045	NAPL-C-31-D	SVOCs	Benzo(b)fluoranthene	UJ	<u> </u>	<b></b>
SAS045 SAS046	OSAA-1-26	VOCs	Chloromethane	LU	C	<del>                                     </del>
SAS046	OSAA-1-26	VOCs	Bromomethane	נט	c	<del> </del>
SAS046	OSAA-1-26	VOCs	Chloromethane	03	<u> </u>	<del> </del>
SAS046 SAS046	OSAA-1-46	VOCs	Bromomethane	LU	<u>c</u>	
SAS046 SAS046	OSAA-1-66	VOCs	Chloromethane	UJ	c	-
SAS046	OSAA-1-66	VOCs	Bromomethane	ÜJ	<u>C</u>	
SAS046	OSAA-1-86	VOCs	Chloromethane	UJ	С	L
SAS046	OSAA-1-86	VOCs	Bromomethane	Ωı	C	ļ <u>.</u>
SAS046	OSAA-1-106	VOCs	Chloromethane	UJ	<u> </u>	<del></del>
	OSAA-1-106	VOCs	Bromomethane	UJ	С	
SAS046		1				
SAS046 SAS046	UAA-11-22	VOCs	Chloromethane	UJ	<u>C</u>	
SAS046		VOCs VOCs	Chloromethane Bromomethane Chloromethane	נט נט	C C	

TABLE 6-8
Summary of Qualifications for SDGs SAS044 - SAS049 and G6G070273

	<u></u>	1			<del>,</del>	r
SDG	Sample ID	Analysis	Analyte	URS Qual	Code	New RL
SAS046	UAA-11-62	VOCs	Chloromethane	UJ	C	<b> </b>
SAS046	UAA-11-62	VOCs	Bromomethane	UJ	C	ļ
SAS046	UAA-11-62-D	VOCs	Chloromethane	U)	С	L
SAS046	UAA-11-62-D	VOCs	Bromomethane	UJ		
SAS046	UAA-11-82	VOCs	Chloromethane	UJ	С	<u> </u>
SAS046	UAA-11-82	VOCs	Bromomethane	UJ	C	
SAS046	UAA-11-102	VOCs	Chloromethane	UJ	С	
SAS046	UAA-11-102	VOCs	Bromomethane	UJ	С	<u> </u>
SAS046	AA-P-10-22	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-22	VOCs	Bromomethane	U	С	
SAS046	AA-P-10-42	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-42	VOCs	Bromomethane	UJ	С	
SAS046	AA-P-10-82	VOCs	Chloromethane	UJ	c	
SAS046	AA-P-10-82	VOCs	Bromomethane	UJ	č	
SAS046	AA-P-10-102	VOCs	Chloromethane	บัง	č	<del> </del>
SAS046	AA-P-10-102	VOCs	Bromomethane	נט	Č	
		VOCs		LO3	C	<del> </del>
SAS046	AA-P-10-102-D		Chloromethane			<del> </del>
SAS046	AA-P-10-102-D	VOCs	Bromomethane	UJ	C	
SAS046	AA-P-10-118.5	VOCs	Chloromethane	UJ	С	
SAS046	AA-P-10-118.5	VOCs	Bromomethane	UJ	С	
SAS046	OSAA-1-26	SVOCs	All SVOCs	UJ	Н	
SAS046	OSAA-1-46	SVOCs	All SVOCs	נט	н	<u> </u>
SAS046	OSAA-1-66	SVOCs	All SVOCs	Ü	Н	
SAS046	UAA-11-22	SVOCs	All nondetects	UJ	S	
SAS046	UAA-11-102	SVOCs	1,4-Dichlorobenzene	j	S	
SAS046	AA-P-10-42	Herbicides	Pentachlorophenol	R	m	1
SAS046	OSAA-I-46	Metals	Beryllium	Ü	0	<del>                                     </del>
SAS046	OSAA-1-86	Metals	Beryllium	Ü	0	†
SAS046	OSAA-1-106	Metals	Beryllium	<del>- 0</del>	0	<del>                                     </del>
SAS046	AA-P-10-62	Metals	Beryllium	U	0	<del> </del>
				U U		<del> </del>
SAS046	AA-P-10-82	Metals	Beryllium	+	•	
SAS046	AA-P-10-102	Metals	Beryllium	U		<b></b>
SAS046	AA-10-102-D	Metals	Beryllium	υ	0	
SAS046	AA-P-10-118.5	Metals	Beryllium	U	0	
SAS046	All metals	Metals	Barium	J	n	
SAS046	All metals	Metals	Chromium	J	n	
SAS046	All metals	Metals	Manganese	J	n	l
SAS046	All metals	Metals	Vanadium	J	n	
SAS046	All metals	Metals	Zinc	j	n	
SAS046	AA-P-10-42	Metals	Aluminum	j	k	·
SAS046	AA-P-10-42	Metals	Potassium	<del></del>	m	
SAS047	SA2-MW-1-D	VOCs	Acetone	ίυ	C	<del> </del>
SAS047	SA2-MW-1-D	VOCs	2-butanone	LUJ CU	č	
SAS047	SA2-MW-1-D	SVOCs	3-Nitroaniline	LU CU	L	<del> </del>
		+		····		<del>                                     </del>
SAS047	SA2-MW-1-D	SVOCs	3,3'-Dichlorobenzidine	R	L	
SAS047	SA2-MW-1-D	Metals	Chromium	U	0	
SAS047	SA2-MW-1-D	Metals	Copper	U	0	
SAS047	SA2-MW-1-D	Metals	Lead	UJ	0	
SAS047	SA2-MW-1-D	Metals	Potassium	J	s	
SAS047	SA2-MW-1-D	Wet chemistry	Nitrate	UJ	h	
SAS047	SA2-MW-1-D	Wet chemistry	Nitrite	R	h	
SAS048	SA2-MW-4-D	VOCs	2-Butanone	נט	С	
SAS048	SA2-MW-1-M	VOCs	2-Butanone	UJ	С	
SAS048	SA2-MW-I-M-D	VOCs	2-Butanone	UJ	Č	
SAS048	SA2-MW-1-S	VOCs	2-Butanone	ίυ	Č	<del> </del>
SAS048	SA2-MW-2-M	VOCs	2-Butanone	UJ	Č	<del>                                     </del>
SAS048	SA2-MW-2-M	VOCs	Bromomethane	UJ	C	
	SA2-MW-2-D	VOCs		UJ	C	<del></del>
SAS048			2-Butanone			<del>                                     </del>
SAS048	SA2-MW-2-D	VOCs	4-Methyl-2-Pentanone	UJ	C	
SAS048	SA2-MW-2-S	VOCs	Bromomethane	ιυ	C	<u> </u>
SAS048	SA2-MW-2-S	VOCs	2-Butanone	UJ	C	ļ
SAS048	SA2-MW-2-S	. VOCs	4-Methyl-2-Pentanone	ÜJ	<u>C</u>	
SAS048	SA2-MW-8-D	VOCs	Bromomethane	UJ	С	
SAS048	SA2-MW-8-D	VOCs	2-Butanone	UJ	С	L
			A Marketta Deservation	UJ	С	l
SAS048	SA2-MW-8-D	VOCs	4-Methyl-2-Pentanone	1 0, 1		
	SA2-MW-8-D SA2-MW-4-M	VOCs VOCs	Bromomethane	נט	Č	
SAS048				<del>, , , , , , , , , , , , , , , , , , , </del>		
SAS048 SAS048 SAS048	SA2-MW-4-M	VOCs	Bromomethane	נט	C C	
SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M	VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone	UJ UJ UJ	C C C	
SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S	VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone	נט נט נט נט	C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S	VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone	UJ UJ UJ UJ UJ	C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S	VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Bulanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane	U) U) U) U) U) U)	C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S SA2-MW-3-S	VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone	01 01 01 01 01 01	C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone	UJ U	C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane	UJ U	C C C C C C C C C C C C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone	UJ U	C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane	UJ U	C C C C C C C C C C C C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone	UJ U	C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S	VOCs VOCs VOCs VOCs VOCs VOCs VOCs VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone	UJ U	C C C C C C C C C C C C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S	VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone	UJ U	C C C C C C C C C C C C C C C C C C C	
SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048 SAS048	SA2-MW-4-M SA2-MW-4-M SA2-MW-4-M SA2-MW-4-S SA2-MW-4-S SA2-MW-3-M SA2-MW-3-M SA2-MW-3-M SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S SA2-MW-3-S	VOCs	Bromomethane 2-Butanone 4-Methyl-2-Pentanone 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone Bromomethane 2-Butnaone 4-Methyl-2-Pentanone	UJ U	C C C C C C C C C C C C C C C C C C C	

TABLE 6-8
Summary of Qualifications for SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Analysis	Analyte	URS Qual	Code	New R
SAS048	SA2-MW-3-D	VOCs	4-Methyl-2-Pentanone	UJ	С	
SAS048	SA2-MW-3-D	VOCs	Bromomethane	UJ	С	4
SAS048	SA2-MW-10M	VOCs	2-Butnaone	UJ	С	
SAS048	SA2-MW-10M	VOCs	4-Methyl-2-Pentanone	UJ	C	.l
SAS048	SA2-MW-10M	VOCs	Bromomethane	U	$\epsilon$	<u> </u>
SAS048	SA2-MW-10D	VOCs	2-Butnaone	UJ	C	<u> </u>
SAS048	SA2-MW-10D	VOCs	4-Methyl-2-Pentanone	UJ	С	
SAS048	SA2-MW-10D	VOCs	Bromomethane	UJ	С	L
SAS048	SA2-MW-10S	VOCs	2-Butanone	UJ	C	
SAS048	SA2-MW-10S	VOCs	4-Methyl-2-Pentanone	UJ	С	
SAS048	SA2-MW-4-D	Pesticides	All Pesticides	UJ	s	
SAS048	SA2-MW-4-D	PCBs	All PCBs	UJ	l	
SAS048	SA2-MW-I-M	Metals	Chromium	U	0	
SAS048	SA2-MW-1-M-D	Metals	Chromium	U	0	1
SAS048	SA2-MW-1-S	Metals	Copper	υ	0	1
SAS048	SA2-MW-2-M	Metals	Chromium	U	0	
SAS048	SA2-MW-2-S	Metals	Chromium	U	0	
SAS048	SA2-MW-2-S	Metals	Copper	U	0	
SAS048	SA2-MW-8-D	Metals	Chromium	U	0	
SAS048	SA2-MW-4-M	Metals	Chromium	U	0	
SAS048	SA2-MW-4-S	Metals	Chromium	U	0	
SAS048	SA2-MW-3-M	Metals	Chromium	U	0	1
- SAS048	SA2-MW-3-S	Metals	Chromium	U	0	
SAS048	SA2-MW-3-S	Metals	Copper	U	0	
SAS048	SA2-MW-3-S-D	Metals	Chromium	υ	0	1
SAS048	SA2-MW-3-S-D	Metals	Copper	υ	0	
SAS048	SA2-MW-10M	Metals	Chromium	υ	0	
SAS048	SA2-MW-10D	Metals	Chromium	υ	0	1
SAS048	SA2-MW-10S	Metals	Copper	υ	0	
SAS048	SA2-MW-10S	Metals	Chromium	υ	0	Ĺ
SAS048	SA2-MW-10S	Herbicides	Pentachlorophenol	R	m	1
SAS048	SA2-MW-3-M	Wet chemistry	Total Organic Carbon	· U	x	
SAS049	SA2-MW-9-S	VOCs	Carbon disulfide	j	L	
SAS049	SA2-MW-6-M	VOCs	Bromomethane	UJ	С	
SAS049	SA2-MW-6-M-Dup	VOCs	Bromomethane	ເນ	С	1
SAS049	SA2-MW-6-D	VOCs	Bromomethane	L/J	С	
SAS049	SA2-MW-9-D	VOCs	Bromomethane	IJ	С	Ì
SAS049	SA2-MW-9-D-D	VOCs	Bromomethane	UJ	C	
SAS049	SA2-MW-9-M	VOCs	Bromomethane	UJ .	С	
SAS049	SA2-MW-9-S	VOCs	Bromomethane	נט	С	
SAS049	SA2-MW-5-D	VOCs	Bromomethane	UJ	C	1
SAS049	SA2-MW-5-S	VOCs	Bromomethane	LU LU	c	1
SAS049	SA2-MW-5-M	VOCs	Bromomethane	LU	С	1
SAS049	SA2-MW-7-M	VOCs	Bromomethane	ίυ	c	1
SAS049	SA2-MW-7-D	VOCs	Bromomethane	LU	c	1
SAS049	SA2-MW-6-D	Metals	Aluminum	Ü	0	†
SAS049	SA2-MW-9-D	Metals	Aluminum	υ -	0	†
SAS049	SA2-MW-9-D-D	Metals	Aluminum	Ü	0	†
SAS049	SA2-MW-5-D	Metals	Aluminum	Ŭ	0	t

A xibnaqqA



TABLE A-1

### Analytical Results SDGs SASO44 - SASO49 and G6C070273

1	n'c I	T T	СһІоготегьале	AOC2	Groundwater	Z9-11-VV	940SAS
<u> </u>	ວ່ານ	1	Вгототерапе	VOC5	Groundwater	Zb-11-420	940SVS
ļ <del>-</del>	o'm	<del>                                     </del>	СһІототегһале	AQC2	Groundwater	ZÞ-11-4V)	940SA2
· ·	Dir.C		Вгототейале	VOC5	Groundwater	10AA-11-22	940SA2
i	mc	<del>                                     </del>	Сыоголенале	AOCs	Groundwater	22-11-AU	940SA8
	D'm	i	Вгототеграпе	VOC5	Groundwater	901-I-VVSO	940SA2
i	310	i	Chloromethane	ΛΟC2	Groundwater	901-1-VVSO	9¢0S∀S
<del></del>	m'c	<del> </del>	Втототствале	AOCs	Groundwater	98-1-VVSO	970SYS
<del>                                     </del>	3'0	<del> </del>	Chloromethane	AOC2	Groundwater	98-1-VVSO	950SAS
<del></del>	orc	i	Bromomerhane	VOCs	Groundwater	99-1-VVSO	940SA2
i	3'11	<del> </del>	Сијоготенале	AOCs	Groundwater	99-1-VVSO	9t0SVS
<del></del>	D'II	<del>                                     </del>	Bromomethane	AOC2	Groundwater	9b-1-VVSO	940SAS
<del>                                     </del>	nıc	i	Chloromethane	VOC5	Groundwater	9t-1-VVSO	920SVS
<del></del> -	n'c	1	Вгототств	VOC5	Groundwater	97-I-VVSO	940SVS
<del>                                     </del>	n'c	<del> </del>	Chloromethane	VOCs	Groundwater	97-1-VVSO	9t0848
430	u,c	054	Benzo(b)fluoranthene	\$AOC\$	fio2	NAPL-C-31-D	SPOSAS
0061	OJ,C	0061	2,4-Dinitrophenol	SAOC2	lios	NAPL-B-138	SPOSVS
430	z'n	370	B15(2-ethylhexyl) phthalate	SAOCS	lioS	NAPL-C-31-D	SPOSAS
0\$2	Z'n	052	Bis(2-ethylhexyl) phthalate	SAOC2	lios	NAPL-B-138	SPOSAS
310	S'ſ	0058	Chlorobenzene	\$OOV	lio2	NAPL-C-31-DDL	SYSOSYS
1 &	3°C	5.2	Carbon Disulfide	VOCs	lioZ	NAPL-B-138	SPOSYS
18	1°C	SE	Acetone	AOC2	lios	NAPL-B-138	SPOSVS
81.0	<u> </u>	18.0	Ammonia	General Chemistry	IIOS	\$ 0-88-12-0-198	740SA2
110	d'n	058	muiboZ	Metals	lios	\$0!I-Q-21-SB-4°	\$408A8
0052	1,10	0052	MCPA	Herbicides	lioS	Soil-Q-12-SB-4'	770SVS
4800	1,tU	0085	MCPA	Herbicides	lios	\$.0-SS-12-Q-1ioS	₽₽0S∀S
0000Z	N,R	30000	Pentachlorophenol	SAOC	lios	Sol-0-1-85-0.5	P+OSVS
0000Z	<u> </u>	20000	2,4-Dinitrophenol	SAOCS	lio2	\$ 0-85-12-0-198	##OSVS
065	Z'n	89	Bis(2-cthylhexyl)phthalate	SAOC	lios	NAPL-A40	PHOSYS
965	1.5 BC	390	Dinoseb	SAOCS	lios	NAPL-A-40	PPOSVS
065	2,00	068	Benzo[k]ilnoranthene	SAOCS	lios	NAPL-A-40	PPOSYS
0007	R.C.	000Z	4,6-Dinitro-2-methylphenol	SAOCS	lios	NAPL-A-40	₽₽0S∀S
0061	on'c	0061	4'6-Dinito-2-methylphenol	SAOCs	lio2	8E1-A-J9AN	SAS044
2000	m'c	2000	4.6-Dinitro-2-methylphenol	SAOCs	lio2	NAPL-B-139	\$POSYS
1900	n'c	0061	4,6-Dinito-2-methylphenol	SAOCs	lio2	NAPL-B-34	PP0SA2
2000	nı,c	0002	4,6-Dinitro-2-methylphenol	SAOC	lio2	NAPL-C-139	5408A2
7300	n'c	7300	4,6-Dinitro-2-methylphenol	SAOCs	lioS	NVbF-C-31	\$¥0\$¥\$
0000Z	u,c	20000	4,6-Dinitro-2-methylphenol	SAOCs	lioS	\$.0-22-12-Q-Iio2	\$¥0\$¥\$
2100	J,U	2100	4,6-Dinito-2-methylphenol	SAOCs	lio2	Soil-Q-21-5B-4"	PPOSVS
370	J,tU	048	2,6-Dinitrotoluene	SAOCs	lio2	NAPL-A-138	**OSVS
390	n'c	360	2,6-Dinitrotoluene	SAOC <sup>2</sup>	lio2	0FA-J¶AN	**OSVS
380	D'm	380	2,6-Dinitrotoluene	\$AOC2	lio2	NAPL-B-139	PP0SYS
0/.٤	m'c	0/18	2,6-Dinirotoluene	SAOCs	lioZ	NAPL-B-34	140SVS
380	ວ'ເດ	380	2,6-Dinitrotoluene	SAOCs	lio2	NAPL-C-139	**OSVS
420	m'c	054	2,6-Dimitrotoluene	2AOC2	lioS	NAPL-C-31	140SA2
006€	D,C	906£	2,6-Dinitrotoluene	2AOC2	lioZ	5.0-22-12-Q-fio2	\$408A2
410	D,C	015	2,6-Dinitrotoluene	2AOC2	IioS	Soil-Q-21-5B-4'	\$408A8
310	m'c	0/18	2,4-Dinitrotoluene	SAOCs	lioZ	8E1-A-J4AN	\$\$0\$VS
96€	mc	366	2,4-Dinitrotoluene	SAOCs	lioZ	NAPL-A-40	₽₽OS∀S
380	n,c	380	2,4-Dinitrotoluene	SAOC	lioZ	NAPL-B-139	PP0SA2
310	m'c	0/2	2,4-Dimtrotoluene	SAOC®	lio2	NAPL-B-34	₽₽0S∀S
380	o,tu	380	2,4-Dinitrotoluene	SAOCs	lioZ	NAPL-C-1399	7402A2
420	m'c	054	2,4-Dinitrotoluene	SAOC	lioS	NAPL-C-31	140SA2
300€	n'c	006€	2,4-Dinitrotoluene	SAOC2	lioS	\$ 0-SS-1Z-O-1!OS	PPOSVS
017	nrc	014	2,4-Dinitrotoluene	SAOC	lioZ	Soil-Q-21-SB-4	PP0SVS
8.£	s'm	8.E	Styrene	40Cs	lio2	NAPL-C-139	PP0SVS
8.£	s'í	067	Chlorobenzene	VOC5	lio2	NAPL-C-139	545044
3.8	s,tu	8.€	Tetrachloroethene	VOCs	lioZ	NAPL-C-139	PP0SVS
16	s'm	61	4-Метлу1-2-репталопе	VOC5	lio2	NAPL-C-139	\$408A8
61	s,tu	61	2-Нехалопе	VOCs	lioZ	NAPL-C-139	\$\$0\$¥\$
8.£	s,tu	8.5	Bromoform	VOCs	lio2	NAPL-C-139	\$\$0\$YS
8.£	s'm	8.£	cis-1,3-Dichloropropene	VOCs	lioS	NAPL-C-139	₽₽0S∀S
8.£	s,tU	8.5	Dibromochloromethane	VOC <sub>5</sub>	lioZ	NAPL-C-139	PP0SVS
8.£	s,tU	8 £	trichloroethene	VOC5	lio2	NAPL-C-139	\$\$0\$VS
8 €	s'm	8.€	trans-1,3-Dichloropropene	ΛOC²	lio2	NAPL-C-139	PP0SVS
8.£	s,tu	8.£	1,2-Dichloropropane	NOCe	lioS	NAPL-C-139	PP0SVS
8.5	s,w	8 £	1,1,2,2-Tetrachloroethane	VOC5	lioS	NAPL-C-139	PP0SVS
8.5	S'IN	8.€	Bromodichloromethane	VOCS	lio2	NVbC-C-139	PPOSVS
3 8	s,tu	8.€	Carbon tetrachloride	VOC5	lio2	NAPL-C-139	PP0SYS
8.6	s,tu	8 £	1,1,1-Trichloroethane	\$OOA	lio2	NAPL-C-139	\$\$0\$VS
8.5	s,tu	8.5	1,2-Dichloroethane	\$00A	lio2	NAPL-C-139	5408A2
8.E	s,tu	8.5	Сиосогоги	VOC5	fio2	NAPL-C-139	140SA2
8.6	s,tu	8.5	trans-1,2-Dichloroethene	VOC5	lio2	NAPL-C-139	\$\$0SVS
8.5	s,tu	8.6	cis-1,2-Dichloroethene	\$30A	lio2	NAPL-C-139	₽¥0S∀S
8.€	s'rn	8.5	1,1-Dichloroethane	γος	lio2	NAPL-C-139	PP0SVS
8.5	2,10	8.5	1,1-Dichloroethene	VOC5	lio2	NAPL-C-139	P40SA2
8 €	St	L't	Carbon disulfide	4OCs	lio2	NAPL-C-139	PP0SVS
8.5	s'm	8 £	Methylene chloride	AOCs	lioS	NAPL-C-139	₽₽0SYS
8.£	s'm	8.5	Chloroethane	VOC5	lio2	NAPL-C-139	PF0SVS
8.5	s'rn	8.5	Vinyl chloride	VOCs	lio2	NAPL-C-139	₽₽0S∀S
8.5	3111	8.£	Bromomethane	AOCs	lios	NAPL-C-139	PP0SA2
8.5	s'm	<i>L</i> 1	Chloromethane	VOCs	lio2	NAPL-C-139	pp0SVS
TH	URS Qual, Code		Chemical	Рагашетег	LinsM	Cl. 2 WALK	SDC
Lu	11 r-2 1 U 3all	1 4a	U (1777-11.7)	a	H	H 401.13	11 243

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SAS046	UAA-11-62	Groundwater	VOCs	Bromomethane	1	UJ,C	
SAS046	UAA-11-62-D	Groundwater	VOCs_	Chloromethane		UJ,C	1
SAS046 SAS046	UAA-11-62-D UAA-11-82	Groundwater Groundwater	VOCs VOCs	Bromomethane Chloromethane	1	UJ,C UJ,C	1
SAS046	UAA-11-82	Groundwater	VOCs	Bromomethane	i	UJ,C	1
SAS046	UAA-11-102	Groundwater	VOCs	Chloromethane	. 1	UJ,C	1
SAS046	UAA-11-102	Groundwater	VOCs	Bromomethane		UJ,C	1
SAS046 SAS046	AA-P-10-22 AA-P-10-22	Groundwater Groundwater	VOCs VOCs	Chloromethane Bromomethane	1	UJ,C UJ,C	1
SAS046	AA-P-10-42	Groundwater	VOC5	Chloromethane	i	UJ,C	1
SAS046	AA-P-10-42	Groundwater	VOCs	Bromomethane	1	UJ,C	1
SAS046	AA-P-10-82	Groundwater	VOCs	Chloromethane	1	UJ,C	1
SAS046 SAS046	AA-P-10-82 AA-P-10-102	Groundwater Groundwater	VOCs VOCs	Bromomethane Chloromethane	1	UJ,C UJ,C	1
SAS046	AA-P-10-102	Groundwater	VOCs	Bromomethane	1	UJ,C	1
SAS046	AA-P-10-102-D	Groundwater	VOCs	Chloromethane	1	UJ,C	1
SAS046	AA-P-10-102-D	Groundwater	VOCs	Bromomethane	1	UJ,C	1
SAS046	AA-P-10-118.5	Groundwater	VOCs VOCs	Chloromethane	!	UJ,C	
SAS046 SAS046	AA-P-10-118.5 OSAA-1-26	Groundwater Groundwater	SVOCs	Bromomethane Phenol	9.5	UJ,C UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Bis(2-chloroethyl)ether	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2-Chloropheno!	9,5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	1,3-Dichlorobenzene	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	1,4-Dichlorobenzene	9.5 9.5	UJ,H UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2-Methylphenol	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	3 & 4 Methylphenol	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	N-Nitrosodi-n-propylamine	9.5	UJ,H_	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Hexachloroethane Nitrobenzene	9.5 9.5	UJ,H UJ,H	9 5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Isophorone	9.5	UJH	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2-Nitrophenol	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2,4-Dimethylphenol	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Bis(2-chloroethoxy)methane 2,4-Dichlorophenol	9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	1,2,4-Trichlorobenzene	9.5	U,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Naphthalene	9.5	UJ,H	9 5
SAS046	OSAA-1-26	Groundwater	SVOCs	4-Chloroaniline	19	UJ,H	19
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Hexachlorobutadiene 4-Chloro-3-methylphenol	9.5 9.5	UJ,H	9.5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2-Methylnaphthalene	9.5	U,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Hexachlorocyclopentadiene	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2,4,6-Trichlorophenol	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	2,4,5-Trichlorophenol 2-Chloroaphthalene	9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	2-Nitroaniline	48 .	UJH	48
SAS046	OSAA-1-26	Groundwater	SVOCs	Dimethyl phthalate	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Acenaphthylene	9 5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	3-Nitroaniline	48 9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Acenaphthene 2,4-Dinitrophenol	48	UJ,H UJ,H	48
SAS046	OSAA-1-26	Groundwater	SVOCs	4-Nitrophenol	48	UJ,H	48
SAS046	OSAA-1-26	Groundwater	SVOCs	Dibenzofuran	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	2,4-Dinitrotoluene	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26	Groundwater	SVOCs	2,6-Dinitrotoluene Diethyl phthalate	9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	4-Chlorophenyl phenyl ether	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Fluorene	9 5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	4-Nitroaniline	48	UJ,H	48
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	4,6-Dinitro-2-methylphenol N-Nitrosodiphenylamine	9.5	UJ,H UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	4-Bromophenyl phenyl ether	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Hexachlorobenzene	95	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Pentachlorophenol	48	UJ,H	48
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Phenanthrene Anthracene	9.5	UJ,H UJ,H	9 5 9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Di-n-butyl phthalate	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	· SVOCs	Fluoranthene	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Pyrene	9.5	UJ,H	9 5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Butyl benzyl phthalate 3,3'-Dichlorobenzidine	9 5	UJ,H UJ,H	9.5 19
SAS046	OSAA-1-26	Groundwater	SVOCs	Benzo[a]anthracene	9.5	UJ,H	95
SAS046	OSAA-1-26	Groundwater	SVOCs	Bis(2-ethylhexyl) phthalate	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Chrysene	9.5	UJ,H	9 5
SAS046	OSAA-1-26	Groundwater Groundwater	SVOCs SVOCs	Di-n-octyl phthalate	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater	SVOCs	Benzo[b]fluoroanthene Benzo[k]fluoroanthene	9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-26_	Groundwater	SVOCs	Benzo[a]pyrene	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Indeno[1,2,3-cd]pyrene	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Dibenz(a,h)anthracene	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Benzo[g,h,i]perylene	9.5	UJ,H	9.5

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SAS046	OSAA-1-26	Groundwater	SVOCs	Carbazole	9.5	UJ,H	9.5
SAS046	OSAA-1-26	Groundwater	SVOCs	Dinoseb	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Phenol	9.5	UJ,H	9,5
SAS046	OSAA-1-46	Groundwater	SVOCs	Bis(2-chloroethyl)ether	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2-Chlorophenol	9.5 9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	1,3-Dichlorobenzene	9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	1,2-Dichlorobenzene	9.5	UJ,H	9,5
SAS046	OSAA-1-46	Groundwater	SVOCs	2-Methylphenol	9.5	U),H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	3 & 4 Methylphenol	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	N-Nitrosodi-n-propylamine	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Hexachloroethane	9.5	U),H	9.5
SAS046_	OSAA-1-46	Groundwater	SVOCs SVOCs	Nitrobenzene	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs	Isophorone 2-Nitrophenol	9.5 9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2,4-Dimethylphenol	9,5	UJ,H	9,5
SAS046	OSAA-1-46	Groundwater	SVOCs	Bis(2-chloroethoxy)methane	9.5	U),H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2,4-Dichlorophenol	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	1,2,4-Trichlorobenzene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Naphthalene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	4-Chloroaniline	19	UJ,H	19
SAS046	OSAA-1-46	Groundwater	SVOCs SVOCs	Hexachlorobutadiene 4-Chloro-3-methylphenol	9,5 9.5	UJ,H UJ,H	9,5 9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs	2-Methylnaphthalene	9.5	UJH	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Hexachlorocyclopentadiene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2,4,6-Trichlorophenol	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2,4,5-Trichlorophenol	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2-Chloroaphthalene	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	2-Nitroaniline Dimethyl phthalate	9.5	UJ,H UJ,H	48 9.5
SAS046	OSAA-1-46 OSAA-1-46	Groundwater	SVOCs	Acenaphthylene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	3-Nitroaniline	48	UJ,H	48
SAS046	OSAA-1-46	Groundwater	SVOCs	Acenaphthene	. 9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	2,4-Dinitrophenol	48	UJ,H	48
SAS046	OSAA-1-46	Groundwater	SVOCs	4-Nitrophenol	48	UJ,H	48
SAS046	OSAA-1-46	Groundwater	SVOCs	Dibenzofuran	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	2,4-Dinitrotoluene 2,6-Dinitrotoluene	9.5 9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Diethyl phthalate	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	4-Chlorophenyl phenyl ether	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Fluorene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	4-Nitroaniline	48	UJ,H	48
SAS046	OSAA-1-46	Groundwater	SVOCs	4,6-Dinitro-2-methylphenol	48	UJ,H	48
SAS046	OSAA-1-46	Groundwater	SVOCs	N-Nitrosodiphenylamine	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	4-Bromophenyl phenyl ether Hexachlorobenzene	9.5 9.5	UJ,H UJ,H	9.5 9.5
\$AS046	OSAA-1-46	Groundwater	SVOCs	Pentachlorophenol	48	UJH	48
SAS046	OSAA-1-46	Groundwater	SVOCs	Phenanthrene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Anthracene	9,5	UJ,H	95
SAS046	OSAA-1-46	Groundwater	SVOCs	Di-n-butyl phthalate	9.5	UJ,H	9 5
SAS046	OSAA-1-46	Groundwater	SVOCs	Fluoranthene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Pyrene Pural based adda	9.5	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	Butyl benzyl phthalate 3.3'-Dichlorobenzidine	9.5 19	UJ,H UJ,H	9.5 19
SAS046	OSAA-1-46	Groundwater	SVOCs	Benzo[a]anthracene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Bis(2-ethylhexyl) phthalate	9.5	UJH	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Chrysene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Di-n-octyl phthalate	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Benzo[b]fluoroanthene	95	UJ,H	9.5
SAS046 SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	SVOCs SVOCs	Benzo[k]fluoroanthene Benzo[a]pyrene	9.5 9.5	UJ,H UJ,H	9.5 9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Indeno[1,2,3-cd]pyrene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Dibenz(a,h)anthracene	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Benzo[g,h,i]perylene	9.5	บเห	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Carbazole	9.5	UJ,H	9.5
SAS046	OSAA-1-46	Groundwater	SVOCs	Dinoseb	9.5	U),H	9.5
SAS046 SAS046	OSAA-1-66	Groundwater	SVOCs SVOCs	Phenol Bis(2-chloroethyl)ether	9 6 9.6	UJ,H UJ,H	9.6 9.6
SAS046 SAS046	OSAA-1-66 OSAA-1-66	Groundwater Groundwater	SVOCs	2-Chlorophenol	9.6	UJ.H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	1,3-Dichlorobenzene	9.6	UJ,H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	1,4-Dichlorobenzene	9.6	UJ,H	96
SAS046	OSAA-1-66	Groundwater	SVOCs	1,2-Dichlorobenzene	9.6	UJ,H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	2-Methylphenol	9.6	UJ,H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	3 & 4 Methylphenol	9,6	UJ,H	9.6
\$A\$046	OSAA-1-66	Groundwater	SVOCs	N-Nitrosodi-n-propylamine	96	UJ,H	9.6
SAS046 SAS046	OSAA-1-66 OSAA-1-66	Groundwater Groundwater	SVOCs SVOCs	Hexachloroethane Nitrobenzene	9.6 9.6	UJ,H UJ,H	9.6 9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	Isophorone	9.6	U,H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	2-Nitrophenol	9,6	UJ,H	9.6
SAS046	OSAA-1-66	Groundwater	SVOCs	2,4-Dimethylphenol	9.6	UJ,H	9.6
SAS046			SVOCs	Bis(2-chloroethoxy)methane	9.6	UJ,H	9.6

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SA5046	URS Qual, Code   UJ,H  UJ,H	9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6
SAS046   OSAA-1-66   Groundwater   SVOC   4-Chloro-1-methylphenol   9.6	U,H	9.6 19 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.6 48
SASS166	U,H U,H U,H U,H U,H U,H U,H U,H U,H U,H	19 9.6 9.6 9.6 9.6 9.6 9.6 9.6 9.
SA5046   OSAA-1-66   Groundwater   SVOC:   Hessenbiorochaidinen   9.6	U,H	9.6 9.6 9.6 9.6 9.6 9.6 9.6 48
SAS046	U,H U,H U,H U,H U,H U,H U,H U,H U,H U,H	9.6 9.6 9.6 9.6 9.6 9.6 48
SAS046   OSAA-1-66   Groundwater   SVOCs   2.4Methylophthalene   9.6	U,H U,H U,H U,H U,H U,H U,H U,H U,H U,H	9.6 9.6 9.6 9.6 9.6 48
SAS046	UJ,H UJ,H UJ,H UJ,H UJ,H UJ,H UJ,H UJ,H	9.6 9.6 9.6 9.6 48
SAS5046	U,H UJ,H UJ,H UJ,H UJ,H UJ,H UJ,H	9.6 9.6 48
SAS046	UJ,H UJ,H UJ,H UJ,H UJ,H UJ,H	9.6 48
SAS046	U),H U),H U),H U),H U),H	48
SAS046	UJ,H UJ,H UJ,H UJ,H	
SAS046	UJ,H UJ,H UJ,H	9.0
SAS046	UJ,H UJ,H	9.6
SAS046	UJ,H	48
SAS046	UJ,H	9.6
SAS046		48
SAS046	UJ,H_	48
SAS046	UJ,H	9.6
SAS046	UJ,H UJ,H	9.6 9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	48
SAS046	UJ,H	48
SAS046	UJ,H UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	48
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H UJ,H	9.6
SAS046	UJ.H	9.6 9.6
SAS046	UJ,H	19
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046	UJ,H	9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo[k]fluoroanthene         9 6           SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo[a]pyrene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Indeno[1,2,3-cd]pyrene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dibenz(a,h)anthracene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo[a,h,i]perylene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Carbazole         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9.6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater	UJ,H	9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo a]pyrene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Indeno[1,2,3-cd]pyrene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dibenz(a,b)anthracene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo g,b,i]eprylene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Carbazole         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9.6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H UJ,H	9.6 9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Indeno[1,2,3-cd]pyrene         9,6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dibenz(a,b)anthracene         9,6           SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo[g,h,i]perylene         9,6           SAS046         OSAA-1-66         Groundwater         SVOCs         Carbazole         9,6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9,6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9,5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethy)ether         9,5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9,5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9,5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9,5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9,5	UJ,H	9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Dibenz(a,h)anthracene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Benzo[g,h,i]perylene         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Carbazole         9.6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9.6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethy)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H	9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Carbazole         9 6           SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9.6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H	9.6
SAS046         OSAA-1-66         Groundwater         SVOCs         Dinoseb         9.6           SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H	9.6
SAS046         UAA-11-22         Groundwater         SVOCs         Phenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H	9.6
SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethyl)ether         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,H	9.6
SAS046         UAA-11-22         Groundwater         SVOCs         2-Chlorophenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,S UJ,S	9.5 9.5
SAS046         UAA-11-22         Groundwater         SVOCs         1,3-Dichlorobenzene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         1,4-Dichlorobenzene         9.5	UJ,S	9.5
	UJ,S	9.5
I CAROAC I MAA 1199 I C. January I COOC I CONTACT	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 1,2-Dichlorobenzene 9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 2-Methylphenol 9.5	UJ,S	9.5
SAS046         UAA-11-22         Groundwater         SVOCs         3 & 4 Methylphenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         N-Nitrosodi-n-propylamine         9.5	UJ,S UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs Hexafloroethane 9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs Nitrobenzene 9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs Isophorone 9.5	UJ,S	9.5
SAS046	UJ,S	9.5
SAS046         UAA-11-22         Groundwater         SVOCs         2,4-Dimethylphenol         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethoxy)methane         9.5	UJ,S	9.5
SAS046         UAA-11-22         Groundwater         SVOCs         Bis(2-chloroethoxy)methane         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2,4-Dichlorophenol         9.5	UJ,S UJ,S	9.5
SAS046   UAA-11-22   Groundwater   SVOCs   1,2,4-Trichlorobenzene   9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs Naphthalene 9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 4-Chloroaniline 19	UJ,S	19
SAS046 UAA-11-22 Groundwater SVOCs Hexachlorobutadiene 9.5	UJ,S	9.5
SAS046   UAA-11-22   Groundwater   SVOCS   4-Chloro-3-methylphenol   9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 2-Methylnaphthalene 9.5 SAS046 UAA-11-22 Groundwater SVOCs Hexachlorocyclopentadiene 9.5	UJ,S	9.5
SAS046         UAA-11-22         Groundwater         SVOCs         Hexachlorocyclopentadiene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2,4,6-Trichlorophenol         9.5	UJ,S UJ,S	9.5
SAS046   UAA-11-22   Groundwater   SVOCs   2,4,5-Trichlorophenol   9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 2-Chloroaphthalene 9.5	U),S	9.5
SAS046 UAA-11-22 Groundwater SVOCs 2-Nitroaniline 48	UJ,S	48
SAS046 UAA-11-22 Groundwater SVOCs Dimethyl phthalate 9.5	UJ,S	9.5
SAS046 UAA-11-22 Groundwater SVOCs Acenaphthylene 9.5		9.5
SAS046 UAA-11-22 Groundwater SVOCs 3-Nitroaniline 48	UJ,S	40 !!
SAS046         UAA-11-22         Groundwater         SVOCs         Acenaphthene         9.5           SAS046         UAA-11-22         Groundwater         SVOCs         2,4-Dinitrophenol         48		9.5

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

CDC.	F	7	D	T		llung o s . l	T
SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SAS046 SAS046	UAA-11-22 UAA-11-22	Groundwater Groundwater	SVOCs SVOCs	4-Nitrophenol Dibenzofuran	9.5	UJ,S UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	2,4-Dinitrotoluene	9.5	UJ,S	9,5
SAS046	UAA-11-22	Groundwater	SVOCs	2,6-Dinitrotoluene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Diethyl phthalate	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	4-Chlorophenyl phenyl ether	9.5	UJ,S	9.5
SAS046	UAA-11-22 UAA-11-22	Groundwater Groundwater	SVOCs SVOCs	Fluorene	9.5	UJ,S	9.5
SAS046 SAS046	UAA-11-22	Groundwater	SVOCs	4.6-Dinitro-2-methylphenol	48	UJ,S UJ,S	48
SAS046	UAA-11-22	Groundwater	SVOCs	N-Nitrosodiphenylamine	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	4-Bromophenyl phenyl ether	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Hexachlorobenzene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Pentachlorophenoi	48	UJ,S	48
SAS046	UAA-11-22	Groundwater	SVOCs	Phenanthrene	9.5	UJ,S	9.5
SAS046 SAS046	UAA-11-22 UAA-11-22	Groundwater Groundwater	SVOCs SVOCs	Anthracene Di-n-butyl phthalate	9.5 9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Fluoranthene	9.5	UJ,S UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Pyrene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Butyl benzyl phthalate	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	3,3'-Dichlorobenzidine	19	UJ,S	19
SAS046	UAA-11-22	Groundwater	SVOCs	Benzo[a]anthracene	9.5	UJ,S	9.5
SAS046	UAA-11-22 UAA-11-22	Groundwater Groundwater	SVOCs SVOCs	Bis(2-ethylhexyl) phthalate	9.5	UJ,S	9.5
SAS046 SAS046	UAA-11-22	Groundwater	SVOCs	Chrysene Di-n-octyl phthalate	9,5 9.5	UJ,S UJ,S	9,5 9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Benzolb Ifluoroanthene	9.5	UJ,S	. 9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Benzo[k]fluoroanthene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Benzo[a]pyrene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Indeno[1,2,3-cd]pyrene	9.5	UJ,S	9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Dibenz(a,h)anthracene	9.5	UJ,S	9.5
SAS046 SAS046	UAA-11-22 UAA-11-22	Groundwater Groundwater	SVOCs SVOCs	Benzo[g,h,i]perylene Carbazole	9.5 9.5	UJ,S UJ,S	9.5 9.5
SAS046	UAA-11-22	Groundwater	SVOCs	Dinoseb	9.5	UJ,S	9.5
SAS046	UAA-11-102	Groundwater	SVOCs	1,4-Dichlorobenzene	40	J,S	9.4
SAS046	AA-P-10-42	Groundwater	Herbicides	Pentachlorophenol	0.24	R,m	0.24
SAS046	OSAA-1-46	Groundwater	Metals	Beryllium	0.00057	U,o	0.004
SAS046	OSAA-1-86	Groundwater Groundwater	Metals	Beryllium	0.00039	U,o	0.004
SAS046 SAS046	OSAA-1-106 AA-P-10-62	Groundwater	Metals Metals	Beryllium Beryllium	0.00028 0.00041	U,o U,o	0.004
SAS046	AA-P-10-82	Groundwater	Metals	Beryllium	0.00082	U,o	0.004
SAS046	AA-P-10-102	Groundwater	Metals	Beryllium	0.00048	U,o	0.004
SAS046	AA-10-102-D	Groundwater	Metals	Beryllium	0.00039	U,o	0.004
SAS046	AA-P-10-118.5	Groundwater	Metals	Beryllium	0.00049	U,o	0.004
SAS046 SAS046	OSAA-1-26 OSAA-1-26	Groundwater Groundwater	Metals Metals	Barium	0.6	J,n	0.01
SAS046	OSAA-1-26	Groundwater	Metals	Chromium Manganese	0.045 2.5	J,n J,n	0.01
SAS046	OSAA-1-26	Groundwater	Metals	Vanadium	0.078	J,n	0.01
SAS046	OSAA-1-26	Groundwater	Metals	Zinc	0 31	J,n	0.02
SAS046	OSAA-1-46	Groundwater	Metals	Barium	0.36	J,n	0.01
SAS046	OSAA-1-46	Groundwater	Metals	Chromium	0.067	J,n	0 01
SAS046	OSAA-1-46 OSAA-1-46	Groundwater Groundwater	Metals	Manganese	1.9	J,n	0.01
SAS046 SAS046	OSAA-1-46	Groundwater	Metals Metals	Vanadium Zinc	0.023	J,n J,n	0.01
SAS046	OSAA-1-66	Groundwater	Metals	Barium	0.88	J,n	0.02
SAS046	OSAA-1-66	Groundwater	Metals	Chromium	0.27	J,n	0.01
SAS046	OSAA-1-66	Groundwater	Metals	Manganese	2	J,n	0.01
SAS046	OSAA-1-66	Groundwater	Metals	Vanadium	0.067	J,n	0.01
SAS046	OSAA-1-66 OSAA-1-86	Groundwater Groundwater	Metals	Zinc	2	J,n	0 02
SAS046 SAS046	OSAA-1-86	Groundwater	Metals Metals	Barium Chromium	0.36 0.095	J,n J,n	0.01
SAS046	OSAA-1-86	Groundwater	Metals	Manganese	1	J,n	0.01
SAS046	OSAA-1-86	Groundwater	Metals	Vanadium	0.016	J,n	0.01
SAS046	OSAA-1-86	Groundwater	Metals	Zinc	1.8	J,n	0 02
SAS046	OSAA-1-106	Groundwater	Metals	Barium	0.18	J,n	0.01
SAS046 SAS046	OSAA-1-106 OSAA-1-106	Groundwater Groundwater	Metals	Chromium	0.051	J,n	0.01
SAS046	OSAA-1-106	Groundwater	Metals Metals	Manganese Vanadium	0.89	J,n J,n	0.01
SAS046	OSAA-1-106	Groundwater	Metals	Zinc	0.56	J,n	0.01
SAS046	UAA-11-22	Groundwater	Metals	Barium	0.54	J,n	0.01
SAS046	UAA-11-22	Groundwater	Metals	Chromium	0.17	J,n	0 0 1
SAS046	UAA-11-22	Groundwater	Metals	Manganese	2	J,n	0.01
		Groundwater	Metals	Vanadium	0,036	J,n	0.01
SAS046	UAA-11-22		Mar. 1	Zinc I	0.2	J,n	0.02
SAS046 SAS046	UAA-11-22	Groundwater	Metals Metals				0.01
SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42	Groundwater Groundwater	Metals	Banum	0.32	3,n	0.01
SAS046 SAS046	UAA-11-22	Groundwater		Barium Chromium	0.32 0.052	J <sub>,</sub> n	0 01
SAS046 SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42 UAA-11-42	Groundwater Groundwater Groundwater	Metals Metals	Banum	0.32	3,n	
SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42	Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater	Metals Metals Metals Metals Metals	Banum Chromium Manganese Vanadium Zine	0.32 0.052 5 0.015 0.22	J,n J,n J,n J,n J,n	0 01 0.01 0.01 0 02
SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-62	Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater	Metals Metals Metals Metals Metals Metals Metals Metals	Barium Chromium Manganese Vanadium Zinc Barium	0.32 0.052 5 0.015 0.22 0.27	J,n J,n J,n J,n J,n J,n	0 01 0.01 0.01 0 02 0.01
SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-62 UAA-11-62	Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater	Metals	Barium Chromium Manganese Vanadium Zinc Barium Chromium	0.32 0.052 5 0.015 0.22 0.27 0.13	J,n J,n J,n J,n J,n J,n J,n	0 01 0.01 0.01 0 02 0.01 0.01
SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046 SAS046	UAA-11-22 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-42 UAA-11-62	Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater Groundwater	Metals Metals Metals Metals Metals Metals Metals Metals	Barium Chromium Manganese Vanadium Zinc Barium	0.32 0.052 5 0.015 0.22 0.27	J,n J,n J,n J,n J,n J,n	0 01 0.01 0.01 0 02 0.01

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SASSIGN   UAL-11-15-12   Cronodwert   Metals   Enterm   9.27   1.0   0.00	SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SASSIGN   CHAN   14-D.D.   Groundwater   Metals   Derivative   Development   Develop								
SASSON   UAAL   142   Cramebers   Media   Nangaree   12						0.23	J,n	0.01
SASSING	SAS046	UAA-11-62-D	Groundwater	Metals	Chromium	<del></del>		
SASSING   UAA-11-0-D								
SASSIGN						·		
SASSIGN   UAAL-11-82						<del></del>		
SASSIGN								
SASSIGN						13		
SASSING   CAALTI-LIG		UAA-11-82	Groundwater	Metals	Vanadium			
SASSIG					<del></del>			
SASS66   IJAA-11-102   Groundwater   Metal   Vasadum   0.017   Jo.   0.91			-					
SASS66   IJAA.1-102								
SASS66							<del></del>	
SASS66   AAP-10-22   Groundwater   Metals   Barium   0.18   Ja   0.01								
SASS06   AAP-10-22   Groundwater   Metals   Mongapore   0.17   Ja   0.01					Barium	0.18	J,n_	0.01
SASSIGN   AAP-10-22   Groundwater   Meals   Vasadium   0.0087   J.g.   0.01	SAS046							
SASSM6   AAP-10-22   Groundwater   Meals   Zinc   0.006   1,0   0.02						<del></del>		
SASSM6								
\$85060 AAP-10-42 Groundwater Metals Chromism 0-0604 Jn 0-09. \$85060 AAP-10-42 Groundwater Metals Vanadium 0-017 Jn 0-09. \$85060 AAP-10-42 Groundwater Metals Vanadium 0-025 Jn 0-00. \$85060 AAP-10-43 Groundwater Metals Vanadium 0-027 Jn 0-09. \$85060 AAP-10-43 Groundwater Metals Vanadium 0-027 Jn 0-09. \$85060 AAP-10-42 Groundwater Metals Vanadium 0-09. \$85060 AAP-10-62 Groundwater Metals Vanadium 0-09.01 Jn 0-09. \$85060 AAP-10-62 Groundwater Metals Barum 0-09.01 Jn 0-09. \$85060 AAP-10-62 Groundwater Metals Metals Salvium 0-09.01 Jn 0-09. \$85060 AAP-10-62 Groundwater Metals Metals Salvium 0-09.01 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Barum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Barum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Barum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Metals Ordenwater Metals Barum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Metals Ordenwater Metals Barum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Metals Ordenwater Metals Datum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Groundwater Metals Datum 0-09.4 Jn 0-09. \$85060 AAP-10-10-10 Grou								
SASSING   AA.P.10-42   Groundwater   Metals   Managemenee   2.7   J.p.   0.01						<del></del>		
SASSM6   AA-P-10-42   Groundwater   Metals   Zinc   0.26   J <sub>n</sub>   0.07								
SASS046   AA-P-10-62   Groundwater   Metal's   Barlum   0.26   J <sub>a</sub>   0.01								
SASSM6			-					
SASSM6   AA-P-10-62   Groundwater   Metals   Manganese   2.7   J.n   0.01								
SASSM6   AA-P-10-62   Groundwater   Metals   Vaundium   0.013   J.n   0.01					<del></del>			
SASSM6   AA-P-10-82   Groundwarer   Metals   Barium   0.38   J.n   0.00								
SASS960   AA-P-10-82   Groundwater   Metals   Barium   0.38   J.n.   0.01   SASS960   AA-P-10-82   Groundwater   Metals   Chromium   0.11   J.n.   0.01   SASS960   AA-P-10-82   Groundwater   Metals   Manganese   2.7   J.n.   0.01   SASS960   AA-P-10-82   Groundwater   Metals   Vanadium   0.022   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Zinc   0.54   J.n.   0.02   SASS960   AA-P-10-102   Groundwater   Metals   Barium   0.24   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Barium   0.050   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Chromium   0.050   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Manganese   4.3   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Manganese   4.3   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Chromium   0.050   J.n.   0.01   SASS960   AA-P-10-102   Groundwater   Metals   Zinc   0.08   J.n.   0.01   SASS960   AA-P-10-102-D   Groundwater   Metals   Zinc   0.08   J.n.   0.01   SASS960   AA-P-10-102-D   Groundwater   Metals   Manganese   3.6   J.n.   0.01   SASS960   AA-P-10-118-5   Groundwater   Metals   Vanadium   0.014   J.n.   0.01   SASS960   AA-P-10-118-5   Groundwater   Metals   Vanadium   0.014   J.n.   0.02   SASS960   AA-P-10-118-5   Groundwater   Metals   Manganese   9.7   J.n.   0.01   SASS960   AA-P-10-118-5   Groundwater   Metals   Manganese   9.7   J.n.   0.01   SASS960   AA-P-10-118-5   Groundwater   Metals   Manganese   9.7   J.n.   0.01   SASS960   AA-P-10-118-5   Groundwater   Metals   Vanadium   0.09   U.0   SASS960   AA-P-10-118-5   Groundwater   Metals						<del></del>		
SASS966   AA-P-10-82   Groundwater   Metals   Manganese   2,7   J.n   0,01		AA-P-10-82	Groundwater		Barium	0.38	J,n	0.01
SASS06   AA.P-10-02   Groundwater   Metals   Vanadum   0.02   1,n   0.01							<del></del>	
SAS906   AA.P-10-102   Groundwater   Metals   Barium   0.24   1,0   0.01								
SASS06   AA.P-10-102   Groundwater   Metals   Barium   0.24   J.n.   0.01				· · · · · · · · · · · · · · · · · · ·				
SAS946   AA.P-10-102   Groundwater   Metals   Chromium   0.096   Jn   0.01					<del>                                     </del>			
SAS966   AA.P-10-102   Groundwater   Metals   Vanadium   0.02   J.p.   0.01			~					
SAS946   AA.P-10-102   Groundwater   Metals   Barium   0.18   J.n   0.02	SAS046	AA-P-10-102	Groundwater	Metals	Manganese	<del></del>	J,n	
SAS906   AA.P-10-102-D   Groundwater   Metals   Bartum   0.18   J.n   0.01			<del></del>					
SAS946   AA.P-10-102-D   Groundwater   Metals   Chronium   0.048   J.n   0.01					·			
SAS946   AA.P-10-102-D   Groundwater   Metals   Manganese   3.6   Jn   0.01								
SAS966					<del></del>			
SASS646   AA.P-10-102-D   Groundwater   Metals   Barium   0.33   J.n.   0.02								
SAS946						0 46		
SAS046   AA.P-10-118.5   Groundwater   Metals   Manganese   9.7   J.n.   0.01		AA-P-10-118.5	Groundwater	Metals				
SAS046   AA-P-10-118.5   Groundwater   Metals   Vanadium   0.015   J,n   0.01   SAS046   AA-P-10-118.5   Groundwater   Metals   Zinc   3.1   J,n   0.02   SAS046   AA-P-10-42   Groundwater   Metals   Aluminum   8.9   J,k   0.2   SAS046   AA-P-10-42   Groundwater   Metals   Potassium   14   J,m   1   SAS047   SA2-MW-1-D   Groundwater   VOC3   Acetone   2.5   UJ,C   2.5   SAS047   SA2-MW-1-D   Groundwater   VOC3   Z-butanone   10   UJ,C   10   SAS047   SA2-MW-1-D   Groundwater   SVOC5   3-Nitroaniline   47   UJ,L   47   SAS047   SA2-MW-1-D   Groundwater   SVOC5   3-Nitroaniline   47   UJ,L   47   SAS047   SA2-MW-1-D   Groundwater   SVOC5   3-Nitroaniline   49   UJ,L   47   SAS047   SA2-MW-1-D   Groundwater   Metals   Chromium   0.0042   UJ,O   0.01   SAS047   SA2-MW-1-D   Groundwater   Metals   Chromium   0.0042   UJ,O   0.02   SAS047   SA2-MW-1-D   Groundwater   Metals   Copper   0.0034   UJ,O   0.02   SAS047   SA2-MW-1-D   Groundwater   Metals   Copper   0.0034   UJ,O   0.02   SAS047   SA2-MW-1-D   Groundwater   Metals   Lead   0.005   UJ,O   0.005   SAS047   SA2-MW-1-D   Groundwater   Metals   Potassium   29   J,S   1   SAS047   SA2-MW-1-D   Groundwater   Metals   Potassium   29   J,S   1   SAS047   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrite   0.5   R,h   0.5   SAS048   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrite   0.5   R,h   0.5   SAS048   SA2-MW-1-D   Groundwater   VOC5   2-Butanone   10   UJ,C   10   SAS048   SA2-MW-1-D   Groundwater   VOC5   2-Butanone   10   UJ,C   10   SAS048   SA2-MW-1-D   Groundwater   VOC5   2-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-D   Groundwater   VOC5   2-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-D   Groundwater   VOC5   2-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-D   Groundwater   VOC5   3-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-D   Groundwater   VOC5   3-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-D   Groundwater   VOC5   3-Butanone   10   UJ,C   10   SAS048   SA2-MW-2-S   Groundwater   VOC5   3-Butanone   10   UJ,C   10   SAS048   SA2-MW-2					<del></del>			
SAS046   AA-P-10-115   Groundwater   Metals   Zinc   3.1   Jn   0.02								
SAS046   AA.P.10-42   Groundwater   Metals   Aluminum   8.9   J.k   0.2			<del> </del>		<del></del>	····		
SAS040   SA2-MW-1-D   Groundwater   Wetals   Potassium   14   J.m   I   SAS047   SA2-MW-1-D   Groundwater   VOCs   Acetone   25   UJ.C   25   SAS047   SA2-MW-1-D   Groundwater   VOCs   2-butanone   10   UJ.C   10   SAS047   SA2-MW-1-D   Groundwater   SVOCs   3-Nitroaniline   47   UJ.L   47   SAS047   SA2-MW-1-D   Groundwater   SVOCs   3-Nitroaniline   47   UJ.L   47   SAS047   SA2-MW-1-D   Groundwater   SVOCs   3-Nitroaniline   19   R.L   19   SAS047   SA2-MW-1-D   Groundwater   Metals   Chromium   0.0042   U.o   0.01   SAS047   SA2-MW-1-D   Groundwater   Metals   Copper   0.0034   U.o   0.02   SAS047   SA2-MW-1-D   Groundwater   Metals   Copper   0.0034   U.o   0.02   SAS047   SA2-MW-1-D   Groundwater   Metals   Lead   0.005   UJ.O   0.005   SAS047   SA2-MW-1-D   Groundwater   Metals   Potassium   29   J.5   I   SAS047   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   UJ.D   0.5   SAS047   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   UJ.D   0.5   SAS048   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   UJ.D   0.5   SAS048   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   UJ.D   0.5   SAS048   SA2-MW-1-D   Groundwater   VOCs   2-Butanone   200   UJ.C   200   SAS048   SA2-MW-1-M   Groundwater   VOCs   2-Butanone   10   UJ.C   10   SAS048   SA2-MW-1-M   Groundwater   VOCs   2-Butanone   10   UJ.C   10   SAS048   SA2-MW-1-S   Groundwater   VOCs   2-Butanone   10   UJ.C   10   SAS048   SA2-MW-2-D   Groundwater   VOCs   2-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-D   Groundwater   VOCs   2-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-D   Groundwater   VOCs   2-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-S   Groundwater   VOCs   3-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-D   Groundwater   VOCs   3-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-S   Groundwater   VOCs   3-Butanone   10   UJ.C   20   SAS048   SA2-MW-2-S   Groundwater   VOCs   3-Butanone   10   UJ.C   10   SAS048   SA2-MW-2-S   Groundwater   VOCs   3-Butanone   10   UJ.C   10   SAS048   SA2-MW-2					+ · · · · · · · · · · · · · · · · · · ·			
SAS047   SA2-MW-1-D   Groundwater   SVOCs   2-butanone   10   UJ,C   10	SAS046	<del></del>				14	J,m	1
SASO47   SA2-MW-1-D   Groundwater   SVOCs   3Nitroaniline   47   UJ,L   47   SASO47   SA2-MW-1-D   Groundwater   SVOCs   3Nitroaniline   19   R,L   19   SASO47   SA2-MW-1-D   Groundwater   Metals   Chomium   0.0042   U,0   0.01   SASO47   SA2-MW-1-D   Groundwater   Metals   Copper   0.0034   U,0   0.02   SASO47   SA2-MW-1-D   Groundwater   Metals   Lead   0.005   UJ,0   0.005   SASO47   SA2-MW-1-D   Groundwater   Metals   Potassium   29   J,5   1   SASO47   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   UJ,h   0.5   SASO47   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   R,h   0.5   SASO48   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   R,h   0.5   SASO48   SA2-MW-1-D   Groundwater   Wet chemistry   Nitrate   0.5   R,h   0.5   SASO48   SA2-MW-1-D   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-1-M   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-1-M-D   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-1-M   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-2-M   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-2-D   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-2-D   Groundwater   VOCs   2-Butanone   10   UJ,C   10   SASO48   SA2-MW-2-D   Groundwater   VOCs   3-Butanone   20   UJ,C   20   SASO48   SA2-MW-2-D   Groundwater   VOCs   3-Butanone   20   UJ,C   20   SASO48   SA2-MW-2-D   Groundwater   VOCs   3-Butanone   10   UJ,C   20   SASO48   SA2-MW-2-D   Groundwater   VOCs   3-Butanone   10   UJ,C   10   SASO48   SA2-MW-2-S   Groundwater   VOCs   3-Butanone   10   UJ,C   10   SASO48   SA2-MW-3-D   Groundwater   VOCs   3-Butanone   10   UJ,C   10   SASO48   SA2-MW-3-D   Groundwater   VOCs   4-Methyl-2-Pentanone   10   UJ,C   10   SASO48   SA2-					<del> </del>			
SAS047         SA2-MW-1-D         Groundwater         SVOCs         3,3"-Dichlorobenzidine         19         R,L         19           SAS047         SA2-MW-1-D         Groundwater         Metals         Chromium         0.0042         U.o         0.01           SAS047         SA2-MW-1-D         Groundwater         Metals         Copper         0.0034         U.o         0.02           SAS047         SA2-MW-1-D         Groundwater         Metals         Lead         0.005         UJ.o         0.005           SAS047         SA2-MW-1-D         Groundwater         Metals         Potassium         29         J.s         1           SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         UJ.b         0.5           SAS048         SA2-MW-1-D         Groundwater         VOCs         2-Butanone         200         UJ.C         200           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ.C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ.C         10           SAS048         SA2-MW-2-D         Groundwater         VOC								
SAS047         SA2-MW-1-D         Groundwater         Metals         Chromium         0.0042         U,o         0.01           SAS047         SA2-MW-1-D         Groundwater         Metals         Copper         0.0034         U,o         0.02           SAS047         SA2-MW-1-D         Groundwater         Metals         Lead         0.005         UJ,o         0.005           SAS047         SA2-MW-1-D         Groundwater         Metals         Potassium         29         J,s         1           SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         UJ,b         0.5           SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         UJ,b         0.5           SAS048         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrite         0.5         R,h         0.5           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-B         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-D         Groundwater         VO								
SAS047         SA2-MW-1-D         Groundwater         Metals         Copper         0.0034         U,0         0.02           SAS047         SA2-MW-1-D         Groundwater         Metals         Lead         0.005         UJ,0         0.005           SAS047         SA2-MW-1-D         Groundwater         Metals         Potassium         29         J,5         1           SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         UJ,h         0.5           SAS048         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         R,h         0.5           SAS048         SA2-MW-1-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-D         Groundwater         VOCs								
SAS047         SA2-MW-1-D         Groundwater         Metals         Lead         0.005         UJ, o         0.005           SAS047         SA2-MW-1-D         Groundwater         Metals         Potassium         29         J, s         1           SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrite         0.5         UJ, h         0.5           SAS048         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrite         0.5         R, h         0.5           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         200         UJ, C         200           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ, C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>								
SAS047         \$A2-MW-1-D         Groundwater         Wet chemistry         Nitrate         0.5         UJ,h         0.5           \$A\$047         \$A2-MW-1-D         Groundwater         Wet chemistry         Nitrite         0.5         R,h         0.5           \$A\$048         \$A2-MW-1-D         Groundwater         VOCs         2-Butanone         200         UJ,C         200           \$A\$048         \$A2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$A\$048         \$A2-MW-1-M-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$A\$048         \$A2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$A\$048         \$A2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$A\$048         \$A2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ,C         2           \$A\$048         \$A2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         2           \$A\$048         \$A2-MW-2-D         Groundwater         VOCs								
SAS047         SA2-MW-1-D         Groundwater         Wet chemistry         Nitrite         0.5         R,h         0.5           SAS048         SA2-MW-4-D         Groundwater         VOCs         2-Butanone         200         UJ,C         200           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-M-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         2         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         20           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs		· · · · · · · · · · · · · · · · · · ·						
SAS048         SA2-MW-4-D         Groundwater         VOCs         2-Butanone         200         UJ, C         200           SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-1-M-D         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ, C         10           SAS048         SA2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ, C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ, C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ, C         20           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ, C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ, C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs								
SAS048         SA2-MW-1-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-M-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4								
SAS048         SA2-MW-1-M-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         20           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs								
SAS048         \$A2-MW-1-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         \$A2-MW-2-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$AS048         \$A2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ,C         2           \$AS048         \$A2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         20           \$AS048         \$A2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           \$AS048         \$A2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           \$AS048         \$A2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           \$AS048         \$A2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           \$AS048         \$A2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         10           \$AS048         \$A2-MW-8-D         Groundwater         VOCs								
SAS048         SA2-MW-2-D         Groundwater         VOCs         Bromomethane         2         UJ,C         2           SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         20           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs<				VOCs	2-Butanone		UJ,C	
SAS048         SA2-MW-2-D         Groundwater         VOCs         2-Butanone         20         UJ,C         20           SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOC								
SAS048         SA2-MW-2-D         Groundwater         VOCs         4-Methyl-2-Pentanone         20         UJ,C         20           SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs								
SAS048         SA2-MW-2-S         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs								
SAS048         SA2-MW-2-S         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10								
SAS048         SA2-MW-2-S         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10								
SAS048         SA2-MW-8-D         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-8-D         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10								
SAS048         SA2-MW-8-D         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10						l		1
SAS048         SA2-MW-4-M         Groundwater         VOCs         Bromomethane         1         UJ,C         1           SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10								
SAS048         SA2-MW-4-M         Groundwater         VOCs         2-Butanone         10         UJ,C         10           SAS048         SA2-MW-4-M         Groundwater         VOCs         4-Methyl-2-Pentanone         10         UJ,C         10								
SAS048 SA2-MW-4-M Groundwater VOCs 4-Methyl-2-Pentanone 10 UJ,C 10								
ANALYSIS ANALYSI ANALY	SAS048 SAS048	SA2-MW-4-M SA2-MW-4-S	Groundwater	VOCs	2-Butnaone	50	UJ,C	50

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SAS048	SA2-MW-4-S	Groundwater	VOCs	4-Methyl-2-Pentanone	500	UJ,C	500
SAS048_	SA2-MW-4-S	Groundwater	VOCs	Bromomethane	500	UJ,C	500
SAS048	SA2-MW-3-M	Groundwater	VOCs VOCs	2-Butnaone	1	UJ,C	
SAS048 SAS048	SA2-MW-3-M SA2-MW-3-M	Groundwater Groundwater	VOCs VOCs	4-Methyl-2-Pentanone Bromomethane	10	UJ,C UJ,C	10
SAS048	SA2-WW-3-W	Groundwater	VOCs	2-Butnaone	1	UJ,C	1
SAS048	SA2-MW-3-S	Groundwater	VOCs	4-Methyl-2-Pentanone	10	UJ,C	10
SAS048	SA2-MW-3-S	Groundwater	VOCs	Bromomethane	10	UJ,C	10
SAS048 SAS048	\$A2-MW-3-S-D \$A2-MW-3-S-D	Groundwater Groundwater	VOCs VOCs	2-Butnaone 4-Methyl-2-Pentanone	10	UJ,C UJ,C	10
SAS048 SAS048	SA2-MW-3-S-D SA2-MW-3-S-D	Groundwater	VOCs	Bromomethane	10	UJ,C	10
SAS048	SA2-MW-3-D	Groundwater	VOCs	2-Butnaone	1	UJ,C	1
SAS048	SA2-MW-3-D	Groundwater	VOCs	4-Methyl-2-Pentanone	10	UJ,C	10
SAS048 SAS048	SA2-MW-3-D SA2-MW-10M	Groundwater Groundwater	VOCs VOCs	Bromomethane 2-Butnaone	10 5	UJ,C UJ,C	10 5
SAS048 SAS048	SA2-MW-10M SA2-MW-10M	Groundwater	VOCs	4-Methyl-2-Pentanone	50	UJ,C	50
SAS048	SA2-MW-10M	Groundwater	VOCs	Bromomethane	50	UJ,C	50
SAS048	SA2-MW-10D	Groundwater	VOCs	2-Butnaone	ì	UJ,C	1
SAS048	SA2-MW-10D	Groundwater	VOCs	4-Methyl-2-Pentanone	10	UJ,C	10
SAS048 SAS048	SA2-MW-10D SA2-MW-10S	Groundwater Groundwater	VOCs VOCs	Bromomethane 2-Butanone	10 10	UJ,C UJ,C	10
SAS048	SA2-MW-10S	Groundwater	VOCs	4-Methyl-2-Pentanone	10	U),C	10
SAS048	SA2-MW-4-D	Groundwater	Pesticides	alpha-BHC	0.048	Uls	0.048
SAS048	SA2-MW-4-D	Groundwater	Pesticides	beta-BHC	0.048	UJ,s	0.048
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater Groundwater	Pesticides Pesticides	delta-BHC gamma-BHC (Lindane)	0.048 0.048	UJ,s UJ,s	0.048
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Heptachlor	0.048	UJ,s	0.048
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Aldrin	0.048	UJ,s	0.048
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Heptachlor epoxide	0.048	UJ,s	0.048
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater Groundwater	Pesticides Pesticides	Endosulfan I Dieldrin	0.048 0.095	UJ,s	0.048
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater	Pesticides Pesticides	4,4'-DDE	0.095	UJ,s UJ,s	0.095
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Endrin	0.095	UJ,s	0.095
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Endrin aldehyde	0.095	UJ,s	0.095
SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater	Pesticides Pesticides	Endosulfan II 4,4'-DDD	0.095	UJ,s	0.095
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater Groundwater	Pesticides	Endosulfan sulfate	0.095 0.095	UJ,s UJ,s	0.095 0.095
SAS048	SA2-MW-4-D	Groundwater	Pesticides	4,4'-DDT	0.095	UJ,s	0.095
SAS048	SA2-MW-4-D	Groundwater	Pesticides	Endrin ketone	0.095	UJ,s	0.095
SAS048	SA2-MW-4-D	Groundwater	Pesticides Pesticides	Methoxychlor	0.48	UJ,s	0.48
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater Groundwater	Pesticides Pesticides	alpha-Chlordane gamma-Chlordane	0.048 0.048	UJ,s UJ,s	0.048
SAS048	SA2-MW-4-D	Groundwater	PCBs	Monochlorobiphenyl	0.094	UJ,I	0.094
SAS048	SA2-MW-4-D	Groundwater	PCBs	Dichlorobiphenyl	0.094	UJ,I	0.094
SAS048	SA2-MW-4-D	Groundwater	PCBs	Trichlorobiphenyl	0.094	UJ,I	0.094
SAS048 SAS048	\$A2-MW-4-D \$A2-MW-4-D	Groundwater Groundwater	PCBs PCBs	Tetrachlorobiphenyl Pentachlorobiphenyl	0.19 0 19	UJ,I UJ,I	0.19
SAS048	SA2-MW-4-D	Groundwater	PCBs	Hexachlorobiphenyl	0.19	1,(U	0.19
SAS048	SA2-MW-4-D	Groundwater	PCBs	Heptachlorobiphenyl	0.28	UJ,I	0.28
SAS048	SA2-MW-4-D	Groundwater	PCBs	Octachlorobiphenyl	0.28	UJ,I	0.28
SAS048 SAS048	SA2-MW-4-D SA2-MW-4-D	Groundwater Groundwater	PCBs PCBs	Nonachlorobiphenyl DCB Decachlorobiphenyl	0.47 0.47	UJ,I UJ,I	0.47
SAS048 SAS048	SA2-MW-1-M	Groundwater	Metals	Chromium	0.0017	U,0	0.01
SAS048	SA2-MW-1-M-D	Groundwater	Metals	Chromium	0 0018	U,o	0 01
SAS048	SA2-MW-1-S	Groundwater	Metals	Copper	0.003	U,o	0.02
SAS048	SA2-MW-2-M SA2-MW-2-S	Groundwater Groundwater	Metals Metals	Chromium Chromium	0.0015	U,o	0.01
SAS048 SAS048	SA2-MW-2-S SA2-MW-2-S	Groundwater	Metals	Copper	0 00086 0.0042	U,o U,o	0.01
SAS048	SA2-MW-8-D	Groundwater	Metals	Chromium	0.0023	U,o	0.01
SAS048	SA2-MW-4-M	Groundwater	Metals	Chromium	0.0061	U,o	0.01
SAS048	SA2-MW-4-S SA2-MW-3-M	Groundwater	Metals Metals	Chromium	0.0013	U,o	0.01
SAS048 SAS048	SA2-MW-3-M SA2-MW-3-S	Groundwater Groundwater	Metals	Chromium Chromium	0.0017 0.0015	U,o U,o	0.01
SAS048	SA2-MW-3-S	Groundwater	Metals	Copper	0.0013	U,o	0.01
SAS048	SA2-MW-3-S-D	Groundwater	Metals	Chromium	0.0011	U,o	0.01
SAS048	SA2-MW-3-S-D	Groundwater	Metals	Copper	0 0058	U,o	0.02
SAS048 SAS048	SA2-MW-10M SA2-MW-10D	Groundwater Groundwater	Metals Metals	Chromium Chromium	0.00094	U,o U,o	0.01
SAS048 SAS048	SA2-MW-10D SA2-MW-10S	Groundwater	Metals	Copper	0.0015	U,0 U,0	0.01
SAS048	SA2-MW-10S	Groundwater	Metals	Chromium	0.0017	U,o	10.0
SAS048	SA2-MW-10S	Groundwater	Herbicides	Pentachlorophenol	0.24	R <sub>,</sub> m	0.24
SAS048	SA2-MW-3-M	Groundwater	Wet chemistry	Total Organic Carbon	1:5	U,x	
SAS049 SAS049	SA2-MW-9-S SA2-MW-6-M	Groundwater Groundwater	VOCs VOCs	Carbon disulfide Bromomethane	1.8	J,L UJ,C	2
SAS049	SA2-MW-6-M-Dup	Groundwater	VOCs	Bromomethane	1	UJ,C	<u>-</u> -
SAS049	SA2-MW-6-D	Groundwater	VOCs	Bromomethane	i	UJ,C	i
				D		1111.6	
SAS049	SA2-MW-9-D	Groundwater	VOCs	Bromomethane	1	UJ,C	
SAS049 SAS049	SA2-MW-9-D SA2-MW-9-D-D	Groundwater	VOCs	Bromomethane	I	UJ,C	1
SAS049	SA2-MW-9-D						1

TABLE A-1

Analytical Results SDGs SAS044 - SAS049 and G6G070273

SDG	Sample ID	Matrix	Parameter	Chemical	Result	URS Qual, Code	RL
SAS049	SA2-MW-5-S	Groundwater	VOCs	Bromomethane	l	UJ,C	1
SAS049	SA2-MW-5-M	Groundwater	VOCs	Bromomethane	1	UJ,C	11
SAS049	SA2-MW-7-M	Groundwater	VOCs	Bromomethane	1	UJ,C	1
SAS049	SA2-MW-7-D	Groundwater	VOCs	Bromomethane	1	UJ,C	1
SAS049	SA2-MW-6-D	Groundwater	Metals	Aluminum	0.16	U,o	0.2
SAS049	SA2-MW-9-D	Groundwater	Metals	Aluminum	0.034	U,o	0.02
SAS049	SA2-MW-9-D-D	Groundwater	Metals	Aluminum	0.035	U,o	0.2
SAS049	SA2-MW-5-D	Groundwater	Metals	Aluminum	0.038	U,o	0.2





		Ι.
Page:	 of	<u> </u>

QUOTE #

### SEVERN TRENT LABORATORIES, INC.

Out Care and			multiple and the	no Piki wa	2000	oreal and the second		AW	orani	DATA.	IN WE	- P - P		17.00	42.77	26124	TIME T	ASSESSED.
PO:	intermetton see a solven		Project Nar		OIU CAR	in the latest of the		10/1	1OC	026	77.3 4	0	CIr-M	-OL	Mah	TILISAN	447.501	25 C 3 1 T S (4 )
WO:			Project Nur			osi 2)	72						d.Cir-			isuii.		
	URS CORPORATION		Bill To:		5A2 9								ir-No		<u> </u>			
	1001 HIGHLANDS PLAZA		Invoice AT	TN	274	<u> </u>	<del></del>						Boz.H		-NoF	ras		
Address:	SUITE 300	NATE WEST	Address:		<del></del>								r-NoF					
71.00.000.	ST. LOUIS MO 63110	······································	ridaross.		<del></del>								ir-Noi					
		<del></del>	1				<del>,</del>						.Clr-N		98			
E-mail:		<del></del>	1				<del></del>	Ħ										
Phone:	314-429-0100		Phone:			·		11										
Fax:	314-429-0562		Fax:					J										
								1	1.15	, " <u>"</u>	<i>::1:</i>	14.	334.5	4	HI,			V 7 19 17 17 18
	ple Description	Preservation	Date	Time	4	Matrix	# Containers			-	[F]	GH	IJ	K	L	MN	이	
	L-0-21-55-05	SEE ANALYSIS/METHODS				SOIL		نللا		XL.	$\Box$	$\perp$						
2 501	4-0-21-38-41	SEE ANALYSIS/METHODS	5-3-06	1400		SOIL		141	CX	k L								
3 78-	,	SEE ANALYSIS/METHODS				SOIL		X										
4 -		SEE ANALYSIS/METHODS				-SOIL-				. T	ΤÏ					Т	$\Box$	
5		SEE ANALYSIS/METHODS	1 j			SOIL		TT			1-7	7		T	T	T		
6		SEE ANALYSIS/METHOPS	Construction of the Constr			SOIL				1					-			
7		SEE ANALYSIS/METHODS				SOIL	† · · · · · · · · · · · · · · · · · · ·	1	+		† †		_		<del>-  </del>	+-	$\overline{}$	<del></del>
8	Francis - I - I - I - I - I - I - I - I - I -	SEE ANALYSIS/METHORS		-		SOIL	<del>                                      </del>	1	+	+	1		-		<del></del>	┿	_	
9		SEE ANALYSIS/METHODS		-	-	SOIL	<del> </del>	+ +	++	+	┿	┉┼╌┤		┿	-	+	<del></del>	فسند المجرسية
10	**************************************	SEE ANALYSIS/METHODS				SOIL		++	+++	ᅷ	┿		_		<del></del>	╬	┝┿	
	7 1. 11			4-4			<del></del>	는		- //-	<del></del>	لبلب				سباب		
	Brand: Higges		Shipment I				<del>, , , , , , , , , , , , , , , , , , , </del>	_	e Du	e (īa			7.1					
1 Redinguish	1.10 - 10 - 10 - 10 - 10 - 10 - 10 - 10	2. Received by:		Date:	lac	3. Relinqui	shed by:	- 1	)ate:		ª. K	eceive	a by:				Date:	
Company:	Time:	Company	<del></del>	Time:	100	Company:			īme:	<del></del>	Con	npany:					Time:	<del></del>
1/K	Troop	Company: 5TC Savanul			045	Company:		- 1			10011	many.					, 11113.	
Comments:																		
Comments:	1 - For TCLP Analysis, see	special instructions	previously	y supp	lied				\$	tand	ard t	turn	_	_ '	Othe	r.		
														ر				
										Rus	h tur	'n						
	<del></del>																	
<u> </u>																		

Sevem Trent Laboratories, Inc.

5102 LaRoche Avenue

Project Manager:

Savannat PATT P • 0 Phone: 912-354-7858

Fax: 912-351-367



	- /		1
Page:	·	of	<u> </u>

QUOTE#

#### SEVERN TRENT LABORATORIES, INC.

Project Number:   Company: URS CORPORATION   Bill To:	VOC(8260) 3-40ml.Cir-MeOH/Nabisulf.  SVOC/Herb 1-500ml.Cir-NoPres  VOC(8260) 1-2oz.Cir-NoPres  Ammonia/Metals 1-8oz.HPDE-NoPres  TCLP¹ 1-500ml.Cir-NoPres  TCLP VOC 1-4oz.Cir-NoPres  PEST/PCB 1-500ml.Cir-NoPres  TCC  B C D E F G H I J K L M N O K
Description   Date   Time   Typu   Matrix   # Containers	VOC(8260) 1-2oz.Cir-NoPres  Ammonia/Metals 1-8oz.HPDE-NoPres  TCLP¹ 1-500ml.Cir-NoPres  TCLP VOC 1-4oz.Cir-NoPres  PEST/PCB 1-500ml.Cir-NoPres  TCC  B C D E F G H I J K L M N O
Property   1001 HIGHLANDS PLAZA DRIVE WEST   Invoice ATTN:	Ammonia/Metals 1-802.HPDE-NoPres  TCLP¹ 1-500ml.Cir-NoPres  TCLP VOC 1-40z.Cir-NoPres  PEST/PCB 1-500ml.Cir-NoPres  TCC  B C D E F G H I J K L M N O
Address: SUITE 300 ST. LOUIS MO 63110  -mail: -mail	Ammonia/Metals 1-802.HPDE-NoPres  TCLP¹ 1-500ml.Cir-NoPres  TCLP VOC 1-40z.Cir-NoPres  PEST/PCB 1-500ml.Cir-NoPres  TCC  B C D E F G H I J K L M N O
ST. LOUIS MO 63110  -mail: hone: 314-429-0100 ax: 314-429-0562    Fax:	TCLP VOC 1-4oz.Cir-NoPres PEST/PCB 1-500ml.Cir-NoPres TCC  B C D E F G H I J K L M N O
-mail: hone: 314-429-0100 ax: 314-429-0562    Fax:	PEST/PCB 1-500ml.Cir-NoPres  TOC  B C D E F G H I J K L M N O
-mail: hone: 314-429-0100 ax: 314-429-0562    Fax:	TOC
Phone: 314-429-0100 ax: 314-429-0562    Fax:	BCDEFGHIJK LMNO
AX: 314-429-0562 Fax:    Sample Description   Preservation   Date   Time   Typo   Matrix   # Containers	BCDEFGHIJKLMNO
C. Sample Description Preservation Date Time Type Matrix # Containers  NAPL-C-3/' SEE ANALYSISMETHODS 5-106 /150 - SOIL  NAPL-C-3/' SEE ANALYSISMETHODS 5-106 /170 - SOIL  TB-2 SEE ANALYSISMETHODS - SOIL	BCDEFGHIJKLMNO
O. Sample Description Preservation Date Time Type Matrix # Containers    VA PI - C - 31'   SEE ANALYSISMETHODS   5 - 8' - 00   InSO   SOIL     VAPU - C - 139'   SEE ANALYSISMETHODS   5 - 8' - 00   V420   SOIL     TB - 2	BCDEFGHIJKLMNO
O. Sample Description Preservation Date Time Type Matrix # Containers    MAPI - C - 31'   SEE ANALYSISMETHODS   5-8' 06   1050 -   SOIL     MAPI - C - 129'   SEE ANALYSISMETHODS   7-06   1420 -   SOIL     TB - 2	BCDEFGHIJKLMNO
NAPL-C-31'   SEE ANALYSISMETHODS   F-8-06   INSO   SOIL     NAPL-C-32'   SEE ANALYSISMETHODS   F-8-06   INSO   SOIL     TB-2   SEE ANALYSISMETHODS   SOIL	
VAPUA C - 139   SEE ANALYSISMETHODS	
SEE ANALYSIS/METHODS SOIL	
SEE ANALYSISMETHODS SOIL	
SEE ANALYSISMETHODS SOIL	
SEE ANALYSISMETHODS - SOIL	
SEE ANALYSISMETHODS - SOIL  SHipment Method:	
SEE ANALYSISMETHOOS  SEE ANALYSISMETHOOS  SEE ANALYSISMETHOOS  SEE ANALYSISMETHOOS  SEE ANALYSISMETHOOS  SEE ANALYSISMETHOOS  SOIL  SEE ANALYSISMETHOOS  Shipment Method:	
SEE ANALYSISMETHOUS SOIL  SEE ANALYSISMETHOUS SOIL  SEE ANALYSISMETHOUS SOIL  ampler: Brand; Hagms Shipment Method:	
SEE ANALYSISMETHOUS - SOIL  SEE ANALYSISMETHOUS - SOIL  ampler: Brand; Hagms Shipment Method:	<u> </u>
SEE ANALYSISMETHOUS - SOIL  ampler: Brand; Hagms Shipment Method:	
ampler: Brand; Hagms Shipment Method:	
ampler: Brand; Higgms Shipment Method:	
	ate Due (fax):
	<u> </u>
Refingulation Date: 3-Relinquished by: Date: 3-Relinquished by: Lack Start Clark	Date: 4. Received by: Dete: 5/9/66
	Time; Company:
ompany: Time: Contpany: Time: Company: 577.	Time: Company: Time: 555
omments: 1 - For TCLP Analysis, see special instructions previously supplied	Standard turn Other
**************************************	
"H\NP• 200	

Severn Trent Laboratories, Inc.

5102 LaRoche Avenue .

Project Manager:

Savannah GA

Phone: 912-354-7858

Fax: 912-351-3673

680-16419



	)	/
Page:	 of	
-	 	

QUOTE#

#### SEVERN TRENT LABORATORIES, INC.

and the second	ina di manana manan	n Constantination	AND THE PROPERTY OF THE PROPER	E-MONTH TO	- Carolinatur (c	entrance.	Westing Guerrano	Marine In 1885 in Paris	wastray.	Carrina	entire a	area de la com	Websel	· wartes	गाइटकाट	e e e e e	18808188	***********************	en e liente	tures.
	antormation	OKNERNSO	CONTROL OF															50.00	r strain	(3.8E)
PO: •			····	Project Na				nvoetigation				0) 3-4					DISU	<u>.                                    </u>	<del></del>	<del>\</del>
WO:	UDO CODDO		· · · · · · · · · · · · · · · · · · ·	Project Nu	mber:		hose 2/	<u> </u>				<b>1</b> 1-								سببزإ
Company:	URS CORPOR			Bill To:	·							0) 1-2 /Mete					Proc			-
Report to:		NDS PLAZA I	JRIVE WEST	Invoice AT	IN:			<del></del>		_							)F168			<del>\</del>
Address:	SUITE 300	20440		Address:	*					TCL		1-500								
	ST, LOUIS MO	7 63110										C 1-4								—"નું—
E-mail:	<u></u>								H	77		/D 1-5	100	III.CIJ	-1401	103				-
Phone:	314-429-0100	·		Phone:				<del></del>	<del>- 10</del>	<del>  / c</del>	_									-25
Fax:	314-429-0562			Fax:			· · · · · · · · · · · · · · · · · · ·		<del>-  </del> j											
۵۸.	314-725-0002		· · · · · · · · · · · · · · · · · · ·	II da.		L				<u> </u>		<del></del> -		-				7	<u> </u>	
	Per E E Source				经规则	ACCENTED A				672.43	30,10	44.45	14.4 A	13.70	- X	- "To !		rate-	NUMBER 1	ाळ्यो
	le Description	The state of the s	Preservation	Date	Time	Type	Anna Carlotte and	# Container				EF					L MALL	JI C	Takkiri.	إنشئت
	PL-13-34		SEE ANALYSIS/METHODS				SOIL	1	ĺχ		+-+	1	7	17	1	<del>-</del>	1 1 1	+-	<del> </del>	<del></del>
	PL-B-13		SEE ANALYSISMETHODS				SOIL		THE RES	k	┿	++	1		74-	<del> </del>	<del>                                     </del>	+-	-	
3 772			SEE ANALYSISMETHODS	3 7-00	11510		SOIL	<del>}</del>			┿	++	- 1		-			-		أججت
	-2				<u> </u>			<del></del>	<u>×</u>		┿┿	-	-	<del>-</del> /-		1			1- :	
4			SEE ANALYSISMETHOSS				soil		-	-	-	44			17 1	crist-/	*	, ,		- (2)
5			SEE ANALYSIS/METHODS				SOIL							11			ecit n		1	
6			SEE ANALYSIS/METHODS			/=	) /SOIL_				$\Box$								Marie Land	
7			SEE ANALYSIS/METHODS			popular	SOIL!				$\prod$	$\top \top$		$\Box$	$\top$					100
В			SEE ANALYSIS/METHODS		7	777	! SOIL			П	П	$\top$	T	П		T				THE REAL PROPERTY.
9			SEE ANALYSIS/METHODS		· · · · ·	-	SOIL				11			77		Ī	T	7	Ī	
10		<del></del>	SEE ANALYSIS/METHODS	I	<del> </del>		SOIL	<del> </del>	_		**	++	十	+	+			+	_	
	Brandi Higo	~ ~ ~	TOCK PARTICION ET TOOS	Shipment I	l dothod		1 00.2			te D	10 /6			4	-	<del>- 77</del>	7	<del>/</del>	<del></del>	
		7 h Ba	2. Received by:	Shipment				1.41	100	_			4	eg by	1	<del>12//</del>	$H_{f}$	15-	ite:	
Relinquishe	1000	5-9-06	B-Q-		Date:	1.1	3. Relinquis		_	Date:			T,		IJ~1/	$\mathcal{X}\mathcal{Y}$	ע	100	540	C
Company:	225	Time:	1	<del></del>	Time:	704	Company:	z jon		Time:				24	1	<del>;</del> —				
//	2C ~	0730	Company: -5/2		07	3/3	ST	Stilou	1 9	180		177	(han	314	50	•		12	39 v	
	-						15	- STILLING	5	HOU	<u>~</u>	Щ.,	<u> </u>							
Comments:	1 - For TCLP	Analysis, see	special instructions	previously	y supp	lied					STAN.	dard (	hum	)		Oth	er			
								•		C.	> tall			٠,				_		
											D	sh tur	-							
											KU	on tul								
					<del></del>	1											_0	44		
_								11 8									-			
Source Trees	I abaratarias inc	E400	l «Bache Avenue			_ !~	77 R APR	41.1.		<u>-</u>	. <b>.</b>	. ====		-77 A	1.4	_	~	· ~	10 054	0070
Sevem Trent	Laboratories, inc.	5102	LaRoche Avenue Project Manager:			Savanii	FEMP.	406	Ph	one: 9	12-35	4-7858	6	80-	16	552	3	ex: 9	12-351-	3673

	. •
SEVERN	CIT
$\mathbb{T}^{l}RENT$	JIL

•	' . '	1	. 1	
Page:		of	<u> </u>	· · · · · · · · · · · · · · · · · · ·

QUOTE#

#### SEVERN TRENT LABORATORIES, INC.

	endrina ninderi	•						SEVE	RN	i Ti	REF	VT I	_AE	SOR	AT	OR	IES	, ir	rc.
Ustomer	information.		PARAMETER AND	Přoject in	formát	on la	J. 144 145 185		An	álýsl	ś/Me	that	5)	酸酸	i Ali	NV.	415	消化	(4) (4) (5)
Ö: •				Project Na	me:	SA2 3199		ne Harton	A	VOC	(826	0) 3-	40ml	.CIr-l	VeO	H/Na	bisul	f.	
O:			· · · · · · · · · · · · · · · · · · ·	Project Nu	mber;	VInc	4-(2/3							nl.Cli					
ompany:	URS CORPO	PRATION	1	Bill To:	~	<del></del>	********		ch	VOC	(826	0) 1-	2oz.C	Ir-N	oPre	8			
port to:	1001 HIGHL	ANDS PLAZA	DRIVE WEST	Invoice AT	TN:				D /	Amm	onia	/Met	als 1	8oz.	HPD	E-No	Pres	3	
dress:	SUITE 300			Address:					ΕĪ	TCLF	31 1	-500	ml.C	Ir-No	Pres	j			
į	ST. LOUIS M	10 63110		1					F	<b>TULF</b>	2 VO	C1-	ioz.C	Ͻr-Ne	oPre	\$			
				]					G	PES.	r/PC	B 1-	500n	ıl.Cir	-NoP	res			
mail:									H	77	3/								
	314-429-010			Phone:		,													
x:	314-429-056	2	· · · · · · · · · · · · · · · · · · ·	Fax:					1										
		e a constant a constant			allisa e sancina		· 		(7 <del> (M/</del>		otare:	a <del>existra</del>	inione		. Annivers	200.20		- 9242	or Control
		<b>,这个人的工程的工程,</b>	the state of the s	12 74775-1-10-1-1		.,,,,			27.7	Y PX	4								10. 32.
	le Descriptio		Preservation	Date	Time	Type		# Containers		ВС	DI	EIF			JK	L.	MI	NIO	
	YL-14-41		SEE ANALYSIS/METHODS		109140	4	SOIL		N	k			<u> </u>	Ш				丄	1
NA	22-A-13	38	SEE ANALYSIS/METHODS	570-00	1310		SOIL		Ld'	ĸ	П	П	_ X	$\Box$			П		
784			SEE ANALYSIS/METHODS			·	SOIL	T	k	$\top$		77		П	T			7	T
1			SEE WWW.YSIS/METHODS			1	SOIL						. T		T		1		
-			SEE ANALYSIS/METHODS		<del>                                     </del>		SOIL	<u> </u>		. tr.   Up T		+	7	1		_	-	_	1
-			SEE ANALYSIS/METHODS		-		SOIL		-	-	-	+++	+	++	+-		┾╼┾╸	+	1
+					<del> </del>	<del></del>	THE RESERVE OF THE PARTY OF THE		┷╇	-	┝╍┝╸	┿┽		┿	+-		<del>  -</del>	+-	-
		7 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	SEE ANALYSIS/METHODS			7	SOIL		<del>   </del>	-	-	+	ᄪ		N/F			4	<u> </u>
			SEE ANALYSIS/METHODS		7		SOIL								VI	نمال		4	-
			SEE ANALYSIS/METHODS	77//	1//	<u> </u>	SOIL		Ш								Ш		<u> </u>
	1		SEE ANALYSIS/METHODS	1	V	***	SOIL												
mpler:	Brandi Higg	ins 80 5/11/6	(	Shipment	Method	:		· · · · · · · · · · · · · · · · · · ·	Dat	e Du	e (fa	x):							
Relingiplehis	d by	Date 5 110	2. Received by:		Date:		3. Relinquis	shed by:	10	Dale:	,	4. F	eceiy	ed by:		-		Da	te: ,
974	$\overline{Z}$	5-10-00	B-0-P		5/11	่อย	1 B R		10	5/4	/00	1	ΚC	<b>~</b>				5	to: (12/06
mpany: //	617	Time:	Сотралу:		Time:		Company:			īme:		Cor	npany	:				Th	ne:
116	<u> </u>	07:5	512-512		0	115	50%-	5R-	- 1/	1834	<b>D</b>	9	TLS	AV				10	7724
nmente:	1 - For TCLF	Analysis, see	special instructions	previousi	y supp	lied			(		<del>-</del>	lard			_	Oth	er		
							68	50-16419		_	Rus	h tu	'n		ر				

Severn Trent Laboratories, Inc.

5102 LeRoohe Avenue Project Manager. Savannah GA

Phone: 912-354-7858

Fax: 912-351-3673



QUOTE#

#### SEVERN TRENT LABORATORIES IN

can a compatibility	The state of the s		12/21/24/2014	o cumurante	WING APPLI			PASW	25 1 40 7	117/11	100.00	ddei				e de	e de la comp	A CAR	
o:	Mormation								F 111 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								isulf	2 1 1 T	
U; /O:			Project Na				nvestigation											You	
	URS CORPORATION		Bill To:	mber:	41561	<u> </u>	hase a13					1-50 1-20					. <u>1.17)</u> 	100	
	1001 HIGHLANDS PLAZA		Invoice AT	781.		<del></del> -	<del></del>												
				118:								00m				-140	1100		100
	SUITE 300 IST. LOUIS MO 63110	<del></del>	Address:	ŀ			_ <del></del>					1-40						<del></del> -	100
	51. LOUIS MO 63110	<del></del>			<del></del>							1-50							
-mail:	<u></u>		Į				<del></del>		70		ÇB	1-50	Offic.	Cil-i	101	63			. 83
hone:	314-429-0100		Phone:	-				<del>l: I</del>	<u>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</u>	<u>~</u>									<del></del>
	314-429-0562		Fax:		-	<del></del>		ازا											
<u> </u>	10:11 120 0002		1. 02.	ا		<del></del>	<del></del>	10.1	_										
		Age Technical and Walter and Section 1992	STATE OF THE PERSON NAMED IN	CLANE OF	TO THE PARTY OF				SS 11 .	17.15	Y	7. T. T. T. T.	int.	ile provide	N.	Sin live	li vi	7100	entroles La
	ole Description	Preservation	Date	Time	1.22   1.43   1.43	Matrix	# Containers	TAI	BI	CÍD	E	FIG	THI	IJ	K	L	M	V O	10.00
	U-A - (75-80')	SEE ANALYSIS/METHODS	·			SOIL	/			1	1		X						
NA	DL-A - (95-100'	SEE ANALYSIS/METHODS	5-1500	07:50		SOIL	/	Ï			П		X	7				$\top$	
NA	PL-A -(105-110')	SEE ANALYSISMETHODS				SOIL	1	П					X	T					
NAP	L·B-(20-25)	SEE ANALYSISMETHODS	5-16-06	08.30		SOIL	1	П		7	П	$\top$	KI	T			$\sqcap$		
NAP	1-3-180-85)	SEE ANALYSIS/METHODS				SOIL	1 /		T	T	H	T	V	T					
WAPL	- B-(110-115)	SEE ANALYSIS/METHODS				SOIL	/		T			1	V	T	П		TΤ	T	
	B-138-m5/mSD	SEE ANALYSIS/METHODS				SOIL	3.	П	7				П		Π			7	
WAR	-B-132-ms/meD	SEE ANALYSIS/METHODS				SOIL	2	$\Box$		Τ			X	Т			П		
	-R-138-MSIMSN	SEE ANALYSISMETHODS			<i></i>	SOIL	الق	8		X	П	T		T					
MAHPL	- B-138-ms/msD	SEE ANALYSISMETHODS	5-16-06	11:20	***	SOIL	2x3	X		T	П		П	T					
	Ternifer Kupag		Shipment I			7	11	Da	te C	ue (	fax)	:							·
Belinquishe	ed by: Date:	2. Received by		0304	8/06	179	sheet of		Đajá 57/	8/0	6	Rec گر	eive	by:	9			Dai	1100
mpany:	Time: 0740	TWI-CITE EX	P	Time:	:40	Company:	LITE EXP.		Time			Comp	any:	5/	2			Tim	
omments:	1 - For TCLP Analysis, see		previously	· · · · · · · · · · · · · · · · · · ·	lled		4,3					d tu turn				Oti	ner		
	Laboratories, Inc. 5102  Third by 5-Lif  Flexion Meanson	LaRoche Avenue Project Manager:			Savannah	GA NU	woo STL					10.	•	16	12,	5	F	ax: 9'	2-351-3873



1,1°C

Page: a of a

QUOTE#

#### SEVERN TRENT LABORATORIES, INC

																		IC.
us tomer-	Information and call have		Rro ectint	ordiati	ones di	Autom to him		Χŋ	lýsi.	SXM(E	thod	1						
PO:			Project Nar				nvestigation									bisul	<u>f</u>	· · · · · · · · · · · · · · · · · · ·
VO:			Project Nur	nber:	a15616	83 -PhQ	R 2/3				rb 1-			_				
	URS CORPORATION		Bill To:								0) 1-2					-		
	1001 HIGHLANDS PLAZA		Invoice AT	TN:												oPres	-	
	SUITE 300		Address:	Ļ							-500							
	ST. LOUIS MO 63110										C 1-4							
E-mall:	<del>}</del>			}	<del></del>		<del></del>		787		B 1-5	UUI	11.UI	-140	Pres			
	314-429-0100		Phone:	- 0		<del>-</del> -		+17-1	100	<del>-</del>								
	314-429-0562		Fax:				·	1.1										
	10.11.100						· · · · · · · · · · · · · · · · · · ·	10 1	_									
Fucha -			20 30 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	A PRINCIPAL PRIN	Can may an		And the state of t	Que e										Altredition
	ole Description	Preservation	Date	Time	Туре	Matrix	# Containers	A	BC	DΙ	E F	GH		JP	L	M	ΝО	
NAF	PC-C-3/-B	SEE ANALYSIS/METHODS	5-17-06	09:10		SOIL	/	$\perp \nu$	abla							$\prod$	$\perp$	
NAI	PL-C-31-D	SEE ANALYSIS/METHODS	5-17-0c	59:70		SOIL	,	B	TV	П	TT	Т		7	Τ	FI	Τ	
3 NAP	2-C-31-D	SEE ANALYSIS/METHODS				SOIL	,	1				V			T		T	
MAPE	L-C-31-0	SEE ANALYSIS/METHODS				SOIL	3	X	1		77			7	T	TT	T	
	PL-(-(20-25)	SEE ANALYSIS/METHODS				SOIL		11	_			Y	7	十			Ť	T
	1-C-(10570):	SEE ANALYSIS/METHODS				SOIL	<del>                                     </del>	$\overline{\Box}$	+		+++		打	十	十		+	
	L-C-100-105)	SEE ANALYSIS/METHODS				SOIL	1 1	++	+-		++	-	衧	十	┿	+	十	
	- TR-4	SEE ANALYSIS/METHODS	21.7	1		SOIL	†	k	-		++	+	7	十	+-	++	十	<del>                                     </del>
9		SEE ANALYSIS/METHODS				SOUT	<del> </del>	Ħ			+++	-	+	<del>-</del>	<del> </del>	++	+	
10	Tiller	SEE ANALYSIS/METHODS		<del>  </del>		SOIC				7	┿┿	╅	+-	-	-	++	┿~	<del>                                     </del>
	Jennier Kupta		Shipment I	Method		. JUSTO WILL		TO2	te Du	o (fr			لسل		<del></del>	_		
						3 - Penings	1					oc ob	od b	<i>.</i> .			In.	ate:
1 Polinguish	Date: No.	MININA.	7	47 18	106	1770				no	4. R	9	1	حرير'			27	1/4/a
Company:		Company:		Time:	100	Company			L <i>yica</i> Cimer:	23		pany		<u></u>			_	me:
رمي آ	P 18740	TULLITY EX	<i>&gt;</i> .	07:	49	16,77-6	TIC CH?	- 1	18	45			5%	_				1845
Comments:	4 For TOLD Analysis on					1744						=						
>V111111111111111111111111111111111111	1 - For TCLP Analysis, se	a special instructions	previousi	y suppi	liea				S	tano	jard (	urn			01	her		
4.	THE WALLES	SEAN BOND	7		<i>(</i> .	20.11	1775										_	_
#	V1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/1/	Sold Bath Bos			Ø	70-16	けんろ			Rus	sh tur	'n						
<del></del>	The Astronomy	- Let	<del></del>			<del></del>						-				<del></del>		
	<del>-,/-\</del>				<del></del>						<u> </u>							
Severn Trent	Leboratories, Inc. 5103	2 LaRoche Avenue			Savannah	GA		Pho	ne: 91	2-35	4-7858					F	ax: 9	12-351-367
51/m.	21 10-6	Project Manager:											,					
in anyor	Detanteron.	05/18/06 18ca	\$.	REC		. بعريول	Wusson		571.		51	181	20	2	- 1	ωc	)	,
1257 .	M) was to				y	-	م محد صدا ۱۱		~		- 1			0	•			

ω



Page:	1	of	/	

					ia Grandina		SEVE		•	T.E	- FT		AĐ'	<b></b>	M 1		IEG	,	10.	
Gustomen	Information		Projectini	ormat	lon A	ACA STOLEY		VA 6	aly	16/1	Visit	iôđi		1214				Dist	PH H	
PO:			Project Na				nvestigation						0ml.0							<del>11 11 (0</del>
NO:			Project Nu	mber:	2156		Phone 43	В	SV	OC (	827	0) 2	L-An	ıb-N	oPri	es				
Company:	URS CORPORAT	ION	Bill To:					С	Met	als	(601	0/74	470)1	-500	Oml.	HPD	E-H	N03		
Report to:		PLAZA DRIVE WEST	Invoice AT	TN:		_							ml.H			S04				
ddress:	SUITE'300		Address:										Amb-							
į	ST. LOUIS MO 63	110	1										-drnb							
0.			4						PC			11-	\mb-	<u> </u>	res					
-mall:	244 420 0400	4.0,	50		ļ		·	뻐	MN	4	· 	<del>,,,</del>		·						
	314-429-0100 314-429-0562	·	Phone:					<del>     </del>						ᅴ어	ther.					
ax;	314-429-0302		Fax:		<u> </u>			J			<del></del>			ــلــ						
	Maro Car Star Sure				354554S-127				ett a		100	8	SK. A.	De de	1	1640	7.10			14.50
	le Description	Preservation		Time	CALCULATE IN THE PARTY OF THE P	Matrix		Ā	B	CID	E	FIC	3 H	I J	ΪK	L		NO		2/4-3/4
	1A-1-26	SEE ANALYSIS/METHODS				Water	1			۲۱۲			+++	+	1				<del>                                     </del>	
	A-1-46	SEE ANALYSIS/METHODS		-		Water	<del> </del>	446		×   ×		十	╅	+	1	<del>                                     </del>	Ħ	_	<del>                                     </del>	***************************************
	A-)-66	SEE ANALYSIS/METHODS		100		Water		100	x 1	7 P	V	+	++	+	<del>†</del>	<del></del>	†	_	┿	وزييضيته
	A-1-86	SEE ANALYSIS/METHODS				Water	T	يبخب	-	× ×	-	+	++	+	+	<del></del>	†	_	+	استندم
116		SEE ANALYSIS/METHODS		1007		Water		12	-74	-	**	-	++	-	╈	-	$\forall$	十	+	
	1A-1-10C	SEE ANALYSIS/METHODS		IUIO		Water	<del>                                     </del>	O	나	dx	17	+	++	┿	┿	<b>-</b>			+	
7	in the state of th	SEE ANALYSIS/METHODS	The second second second second	1	<del></del>	Water		M	~	<del>\</del>	H	7	++	┿	┿	1	Ħ	一十	†	كسند
8	,	SEE ANALYSIS/METHODS		<del> </del>	<del> </del>	Water	<del> </del>		+	+	T	+	+ +	十	Ť	·	Ħ		†	لهضيست
9		SEE ANALYSIS/METHODS		<del>                                     </del>		Water	<del>                                     </del>		$\dashv$	+	Ħ	十	17	十	十	T-			1	***************************************
10		SEE ANALYSIS/METHODS			***	Water		П	寸	十	T	T	7	T	Ť		Ħ		Ť	
Sampler:	Tennier Kyn	Ha Wotton McKerlen ,	Shipment I	Method	i:		- 2//	ĪБа	te C	)ue	(fax	<del></del> );	<del></del>				فحصواء		حمصيك	
i. Relinquiski		e: 2. Received by		Date:		3, Religing	Street by 2///		Date	s:,	1	4. FX	ceive	d by:	``\	^		Di	ate:	Tax
Jenste	K. KY:Ha a	206 THOUTH		6-2	-0U	1/16	FERSON.						aceiye	<u>'M</u>	<u>. L.</u>	<u>لحن</u>	=	_6	12/	106
company) <	z // Jim	, , , , , , , , , , , , , , , , , ,	- A TOO	Time:		Company			Time	5,	,	Cpm	pany:	ر '				Τi	78.5	7.23
CLIL	) 16	15 TWI-LITE EXT	V-C/2	10:19	5	1601-	LITÉ EKR		10	-50			<u>570</u>	<u> - 5</u>	+, (	ou'	15		0->	<u>~</u>
Comments:	1 - For MNA Anal	ysis, see special instructions	previously	lague	ied					_										*****
Qola:		_ 0602-06 1800	•		,					Sta	nda	rd t	um_			Oth	ier			
الريات الم	June June											4			-			_		
		· · · · · · · · · · · · · · · · · · ·									ush	turi	n 	4	20	-/	2	25	B	
	<del></del>				<del></del>										7	7	<u>'</u>			
Jevern Trent	Laboratories, Inc.	5102 LaRoche Avenue			Savannah	GA		Pho	one: !	912-	354-7	858				J		þ12-3	51-3673	ļ
		Project Manager.				79-	7			ļ	7.4			5	.0	B	12	1	.,	
	•		a		MI P	1	TOTAL PROPERTY				8 57	. F .)	38 1		•	/		i		

# SEVERN STL

## CHAIN OF CUSTODY RECORD

	447			۲,
٠.		**	Y	ы
ı.	.O	a		v
	т.	ы	JE.	S.

QUOTE#

#### SEVERN TRENT LABORATORIES IN

							يم. ز م			200			(A)	4				
Customer information 3.5		Project inf	organi	ne a				aiyşi								4		
PO: 36 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Project Na	me; 8	A2 Supp	lemental ir	vestigation	A	VOC	(826	0) 4-	40m	I.Cir	HCI		1104	a jai		
WODERS 在 Text 信仰 首集 Extra		Project Nu	mber:	Phas	e 2 x	3	В	SVO	C (82	270)	2L-A	mp-	NoP	resy	36333	3.1	15.3	
Company: URS CORPORATION		BIII To:					C	Meta	ls (6	010/	7470	)1-5	00m	HE	)E\HI	0	學	
Report to: 1001 HIGHLANDS PLAZA	DRIVE WEST	Invoice AT	TN:					Amm							4: V 3	*		
Address: SUITE 300		Address:	Į.		<del></del>		-	Herb							8.4	3.7		
ST. LOUIS MO 63110	<del></del>	i .				<del></del>	_	Pesti			_				100		**************************************	
'			-				_	PCB	~	71	-Am	D-1/10	Pres	8	. 6. 200	112		
E-mall:		Phone:		<del></del>			۳	MNA	<u> </u>				Othe		40,00	e 7. ce 1		
Phone: 314-429-0100		Fax:					1						JOINE	ır,		: X		
Fax: 314-429-0562	<del></del>	(FdX:			<del></del>		اللك						Ь			7.44	-1000 P	
	A CONTRACTOR OF THE PROPERTY OF THE PARTY OF						हुकु	- (C) - (C)	1. THE	73.77	17/6	<b>1111</b>	400		42.40	100	33	
No. Sample Description	Preservation	Date	Time			# Containers	A	BC	ĪοΪ	EIF	Gi	HII	Ji	Kľľ	M			
1 OSAA-2-82 UAA-11-22		10-5-06	0950		Water	10		XX				<del></del>		-			200	
	SEE ANALYSIS/METHODS				Water	70	-	2/2		77.7		╅	11	┿			191 @ LYY	
3 11AA-11-63	SEE ANALYSIS/METHODS			- <del> </del>	Water	10	_	VIV			++	+	$\vdash$	┿	1 1		1	
4 UAA-11-(02-D	SEE ANALYSISMETHODS			-	Water	10		X X	-		++	+	╁┼	┿		الدوال	7	VI-20-170-16-19-2
	SEE ANALYSIS/METHODS		ן באכיו		Water	21	<del>)X</del>		++	4	┿┼	┿	++	+-	النبيات			
5 76-7			الشرارزرو				۲.,	4		<del>-  -</del>	┾┿	+	-	<del></del>				, 110 - 11 - P
6 UAA-11-82	SEE ANALYSIS/METHODS				W.ater	10		8 8		<u> </u>	₩	-	++	1:	7	_	15/14/19	
7 (JAA - 11-10)	SEE ANALYSIS/METHODS		1610		Water	10	M	XX	$ \mathbf{K} $	<u> </u>	<b>↓</b> ↓	4	<del>     </del>	1.7		7.2	為流	200
8	SEE ANALYSIS/METHODS		<u>                                     </u>		Water		Ш		Ш				1	1 11		1 10	1500	100
9	SEE ANALYSIS/METHODS				Water			Ш.	$\coprod$	Ц.		$\perp$		نــانــ			N. K	200
10	SEE ANALYSIS/METHODS				Water	1								$oldsymbol{oldsymbol{oldsymbol{oldsymbol{\Box}}}$		. 4	了李	3799
Sampler: TRK	1 1	Shipment I	Method:		مر	- 1/	Dε	te Di	ue (f	ax):	,						55.5%	-
1. Relinquished by: Date:	2. 10 0 0 V/ / //		Date:	1	3 Political	16 V9		Date:		سي	Roce	ved t	35. <i>V</i> 8	1	1	Di	ile:	788
Jennes Kyste 4606	VAR THE		Odo	106	XXXIII	ina		14/M	0/0k	-1	1	<u> </u>	<u> </u>	lx	16		062	2.00
Company: 00	Company:	. <del></del>	Time	_	Company:			Time:		Ċφ	o bar	ν;			. 77.	. 10	ne l	
URS 107:30	WOPLITE E	H,	19.1	5	7721-0	THE EXP		09.	<u>90</u>		$\simeq$	·/C.			11.7		14/6	ALC: OF
Comments: 1 - For MNA Analysis, see	special instructions	previously	suppli	ed :	3.8/4	10/11	7								ر انداده در انداده د	5	1	223
Paline n. To millo	50600			`	2:8/7	10/9.1		\$	Stan	dard	turr	n		Ģ	ther	.,	水を	
Reling Mille o	10<0	••			LXIF.	,/			_					5.3			کا پھیندست انگذشہر جی ز	Birrak
, ,	.000			1		***************************************	7		Ru	sh tu	ırn				11.		126	
	· · · · · · · · · · · · · · · · · · ·			- 12			<del>-1</del>						·····	<u>-</u>			र्गा स्कृ	7 73
Severn Trent Laboratories, Inc. 5102	Na Danka Avenue			0						4 705	·^			-	17			The same
Seveni Hent Laboratones, Inc. 5102	LaRoche Avenue			Savannah	GA		Pho	one: 91	12-35	4-785	8				1.1	912-3	37.361	

Project Manager:

680-17258

ULBIN ADDRESS   LOCATION   SUBMITTED   DATE DUL   DATE DATE DUL   DATE DATE DUL   DATE DATE DUL   DATE DATE DATE DATE DATE DATE DATE DATE	SEV	ERN			OF CUSTODY R	ECC	RD		51		n <b>nah</b> oche Av GA 314					P		(912) 3	stl-inc.com 54-7858 -0165			
STULIABI PROJECT MANAGER  7.0, NAMER  7.0,	TRI	E.N.T	<b>5</b> .						⊃ Alt	ernate L	aborato	ory Nam	ie/Loc	ation				•		•		
CLIENT FAMPLE  CLIENT PHONE  C	PROJECT REFE	RENCE		PROJECT NO.	2 + 3	PROJECT LOCATION (STATE)							RE	QUIRED	ANALY	SIS				PAGE		OF
CLEENT ADDRESS   CONTRACTING THIS WORK (if applicable)   COMPANY CONTRACTING THIS WORK (if applicable)   CONTRACTING THIS WORK (if a	STL (LAB) PROJ	JECT MANAGER			<u> </u>		빔	T		32	8	2nder	£ 7.	A BORE						STANDARÓ R DELIVERY	EPORT.	0
CLEENT ADDRESS   CORREST   CARD   CLESS   SASO   St. Lora   COSTO   COMPANY CONTRACTING THIS WORK (if applicable)   COMPANY	CLIENT (SITE) F	PM		CLIENT PHONE	(~O	CLIENT FAX	Sp		A VEN	3	360	36	197	Z,		•			ļ.	DATE DU	E	
CLEENT ADDRESS   CORREST   CARD   CLESS   SASO   St. Lora   COSTO   COMPANY CONTRACTING THIS WORK (if applicable)   COMPANY	CLIENT NAME	<del></del>	<del></del>			1314 P 1 Wag	(G)			23	28	4.5	30	4-6				ļ		EXPEDITED F	REPORT	0
66/06 1020 AA-P-10-22 X X X X X X X X X X X X X X X X X X	OUTSUT ADDRES	00		Ţ.			18	واء		8	8	de	25	MOR					-	SURCHARGE	2)	
66/06 1020 AA-P-10-12	1001 /4	eplonds i	Plaza Do	ice west St.	300 .	H. LOUR 110 63110	0()	MA IS		1 -	7				1,72 69	IZ WENTER	W9 ex	-	-	AUBADED OF	COOL EDS	SUBMITTED
66/06 1020 AA-P-10-22 X X X X X X X X X X X X X X X X X X	Į.		S WORK (if app	licable)	•		OSTIE	200		五	00	4	3	S.	V		1.5	*		PER SHIPME	NT:3	<u>.</u>
46/06 1020 AA-P-10-22 X X X X X X X X X X X X X X X X X X				SAMPLE IDEN	TIFICATIO	N .	COWE		AF A			NUN	BER OF	CONT	AINERS	SUBMI	TED				REMARKS	
130	6/6/06	1020	AA-P.	-17) - 22	Ą.			x		V	V	V.	X	V	-	. ,						
[6](6)06   1405   A4-P-10-62	6/06		11-0.	10-42		,		<	11	×	V	X	X	Ÿ					·			
[6](6)06   1405   A4-P-10-62   X	6/06	1130	AA-P	-10 - 42 -	MS	/MSD		X	$\coprod$	X	X	Ý.	X	K.								
(a) (b) (c) (b) (c) (d) (d) (d) (d) (d) (d) (e) (e) (e) (e) (e) (e) (e) (e) (e) (e	le/le/0 le	1405	AA-P					1		X	Y	V	X	X			<u></u>	<u>.                                    </u>				
COTOC 0840 AA-P-10-102  COTOC 0840 AA-P-10-102  COTOC 0840 AA-P-10-102  XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	le/letole	1510	73-				Щ	X_			<u> </u>		,	1						!		
COTOCO OSUO AA-P-10-102-0  (O/7/OC 1045 AA-P-10-118.5  RELINQUISHED BY SIGNATURE)  (O/7/OC 1025 AA-P-10-118.5  DATE TIME RELINQUISHED BY: (SIGNATURE)  (O/7/OC 12:20 AA-P-10-118.5  DATE TIME RELINQUISHED BY: (SIGNATURE)  (O/7/OC 12:20 AA-P-10-118.5  DATE TIME RECEIVED BY: (SIGNATURE)  (O/7/OC 12:20 AA-P-10-118.5  DATE TIME RECEIVED BY: (SIGNATURE)  (O/7/OC 13:05  DATE TIME RECEIVED BY: (SIGNATURE)  (O/7/OC 13:05  DATE TIME RECEIVED BY: (SIGNATURE)  (O/7/OC 13:05	Collelole	+	AA-	P-10-82		· · · · · · · · · · · · · · · · · · ·	$\coprod$	X	Ш	X	X	X	X	X						1		
COTTICE 0800 HA-P-10-102-0 K X X X X X X X X X X X X X X X X X X	6/7/00		AA-	P-10-102						K	K	K	8	X		$\Gamma$ E	$\mathbf{M}$	P	8.0			
RELINQUISHED BY SIGNATURE)  DATE TIME RELINQUISHED BY: (SIGNATURE)  OGOT-0.6 1300  RECEIVED BY: (SIGNATURE)  DATE TIME RECEIVED BY: (SIGNATURE)  DATE TIME RECEIVED BY: (SIGNATURE)  DATE TIME  OGOT-0.6 1300  RECEIVED FOR LABORRA GROUPS  RECEIVED FOR LABORRA GROUPS  RECEIVED FOR LABORRA GROUPS  AND	1007	0840	PA-1	<u> </u>	<u>-0</u>			1	Ш	X	14	×	K	X			3.73	-		7,6	·	
RELINQUISHED BY SIGNATURE)  DATE TIME RELINQUISHED BY: (SIGNATURE).  DATE TIME OGOT-0.6 13.00  RECEIVED BY: (SIGNATURE)  DATE TIME OF 7.06 12.20  MANUALLY TIME RECEIVED BY: (SIGNATURE)  DATE TIME  6/7/06/3.05	6/7/06	1045	194-1	7-10-118.5		····		4	$\coprod$	\ <u>\</u>	4	K	8	X				<u>.</u>				
G-70 12:20  RECEIVED TO SHAPE THE TIME RECEIVED BY: (SIGNATURE)  OAT TIME RECEIVED BY:		ļ		<u> </u>	·		11	1	$\bot \bot$		ļ	Ĺ							-			
G-70 12:20  RECEIVED TO SHAPE THE TIME RECEIVED BY: (SIGNATURE)  OAT TIME RECEIVED BY:			ļ				$\coprod$	$\perp$		2	ļ				<u> </u>					<u> </u>		
G-70 /2:20  RECEIVED TO SHAPE TIME TRECEIVED BY: (SIGNATURE)  DATE TIME TRECEIVED BY: (SIGNATURE)  DATE TIME TRECEIVED BY: (SIGNATURE)  DATE TIME  6/7/06/3:05  RECEIVED FOR LUBBERTA GROUP REAL BY: (SIGNATURE)  ABBREAU SECOND BY: (SIGNATURE)  ABBREAU SECO	DEL MIQUIEUED	DV Co do	<u>L</u>	T Barre			IJ	1	X	L,		<u> </u>				0.100.00		<u>  .</u> _		1	······	78.45
DATE TIME RECEIVED BY: (SIGNATURE)  DATE TIME TO RECEIVED BY: (SIGNATURE)  DATE TO REC	AND TO		7		סג		NAME OF	X	<u></u>		DATE	Ina		سرور	KELIN	QUISHE ////2>	e BY: (	SIGNATU	red .	060	7.06	
ABBRATORIUS DIE VAN DI	RECEIVED AT	Steplet As /		DATE TIME	9	RECEIVED BY: (SIGNATU	RE)				DATE	7	TIME		REOF	VED BY	: (SIÇINA	TURE		DATE		
	VIL XXIV			6/7/06/12	<b>≪</b> U	//wsmic		NA STATE	2 m20	eregary.	6/7	106	15.1	) <b>5</b>	4 9 3 5 2 5 1	September	STRAINE L	25Hallens	estretor		NATIONAL PROPERTY.	and the state of t
SEMION / SET TO SET	RECEIVED FOR	LABORAT ORYI		DATE ( - A STATE		CLSTODYINACE	170	y (A)			AVANN		200	AT HE								
	SIGNATORE			a de la companya de			55															

SEVERN			N OF CUSTODY R	ECO	RD	Ø	510	. Savan 2 LaRo annah,	che Av	enue 104				Pł	ione: (	912) 3	st-inc.com 354-7858 2-0165	
TRENT	5	ΓL				•		⊃ Alte	rnate La	aborato	ory Nam	ne/Loca	ation			none:		•
PROJECT REFERENCE	,	PROJECT NO. 2/56/6	<b>⊀</b> 3	PROJECT LOCATION (STATE) TL	1	MATR	ix			٧	RE	QUIRED	ANALY	SIS				PAGE. / OF
STL (LAB) PROJECT MANAGER LYAIAGUI ZIA CLIENT (SITE) PM		P.O. NUMBER	<del></del>	CONTRACT NO.	<u> </u>	$\top$				1		7		-1	-8	3		STANDARD REPORT DELIVERY
CLIENT (SITE) PM  Sob Billman		CLIENT PHON		CLIENT FAX 3/4-129-0462	NDICATE		OLVENT	3608	51A	there	350	chini		Vitorite	Ken	regre		DATE DUE
CLIENT NAME URS Corporation		CLIENT E-MAII			9(0)	Q	AIR Nonaqueous liquid (oil, solvent	VOCs (80408)	500Cs (8310C) HERB (8151A)	Methone, Ethone, Ethe	Ammonia 350.1	CO2, Alkalinity	TOC	Vitimite, Nitrite	Sulfate, Chorick	Motals, Manganese		EXPEDITED REPORT DELIVERY (SURCHARGE)
CLIENT ADDRESS ION HIGHWAY PLAZE COMPANY CONTRACTING THIS V	a Dr. W.	Ste. 300	St. Louis	s. MO 63/10	COR	3	SLLQU	Z		₩	4	7	F	7	পু			DATE DUE
	WORK (if app	licable)			COMPOSITE (C) OR GRA	88 S	QUEOU	174	2000	No.	8	NORCE	3	1,504	3	₹ S		PER SHIPMENT:
SAMPLE TIME		SAMPLI	E IDENTIFICATION	DN .	COMP	첽붊	AR NO.			NUN	ABER OF	CONT	NERS	SUBMI	TTED			REMARKS
6/28/06 1540		SAZ-MW	-1-D					3	4	3	1	1			1	1		
		TB-9				۷_		X										
						#												
	*			,	++	+												
				• •	╁┼	+-		ļ	ļ									
				·	╁┼	+										_		
		•	<del></del>			上		_									-	11/
		<del>.</del>														7	F.	MP.11/11/6
			سسبسسن											4.		_	J	
																	<u> </u>	
RELINQUISHED BY: (SIGNATURE)	<del></del>	DATE	T YOUR	L DC: (NO.)IOUED 69				<u> </u>	5475		TOJE		DC (2)	OLUCI II	esov		11	PATE / TOUT
11#67% kg 1 ## 2 1 c			TIME	RELINQUISHED BY: (S)	L.	<u>+</u>	<b>-</b> .		DATE 6/28	106	TIME 17	60	12		10/8Y: (	111	A.	DATE TIME 18:33
RECEIVED BY: (SIGNATURE)		DATE	TIME	RECEIVED BY USIGNATU	BF C			·	28	106	TIME 178	00	RECE!	VEOSEV	(SIGNA)	AREI LLL	~	6/38/06 TIME 6/38/06 18:33
A THE FOR LABORATORY AV	175	CASSONS DATE	845 ME	CUSTODY INTACT	CUE	RAT.	TRY U	E ONL			1. 17	1110 1110	- 0	, n			7. 48. 14.342	
		11296	ME	YES O	SEA	LINC		12	AVAIVI IG	681	2-,	Pi	20.5					

	AND CHAIN OF CUSTODY F	RECORD	×	510	Savann 2 LaRoct annah, G/	ne Avenu	e			. P	hone:		stl-inc.com 54-7858 -0165	
TRENT STL				⊃ Alter	nate Lab	oratory	Name/Lo	cation			hone: ax:			
PROJECT REFERENCE PROJECT NO. 2 2156/16	PROJECT LOCATION (STATE)	MATR TYPE					REQUIRE	D ANALY	'SIS				PAGE	OF /
STL (LAB) PROJECT MANAGER P.O. NUMBER  CLIENT (SITE) PM, CLIENT PHON	CONTRACT NO.	IR: (G) INDICATE	SOLVENT,)	HACK.	-8370C	#1	10-3D.1	Utoit Ctrik	May	Choristo	with	<b>D</b>	STANDARD REDELIVERY  DATE DUE	
CLIENT NAME  CLIENT E-MAIL  CLIENT E-MAIL	-	OLID	QUID (OIL, SO	VCCs-8240B	Svas-8	Herb-8/6/14	Antaenia -	Natrak. Vitrot	Sphere	suffice a	Coton Oro	ツリ	EXPEDITED R DELIVERY (SURCHARGE) DATE DUI	0
COMPANY CONTRACTING THIS WORK (If applicable)	) He 300 (63/100	POSITE (C)	AQUEOUS U	<i>' ' ' ' ' ' ' ' ' '</i>		3 3	3 3	3 2 2 2	Nove	Joe Bote	18	14		COLERS SUBMITTED
DATE TIME	E IDENTIFICATION	SOLI	NON			NUMBE	R OF CON	TAINERS		TTED	<del>,</del>	· · · · ·	ir 1/6	MARKS OVO
7/5/06/459 8A2-MW-	4-0	K		3	2	2	1 1	11/	3	1	/	1	Perb	and Higgins
		111				-	_	<u> </u>						sample is
		444												be analyzed
		1111						-						49CBS
	<del></del>		$\bot$			-		<del> </del>				ļ		bevisor 200
			$\perp$					<del> </del>					Shyl	Respondent
			_				}	<del> </del> -				<u> </u>	0	· · · · · · · · · · · · · · · · · · ·
			- -					<del> </del>						
		+++					<del>-}</del>	┼		-				· · · · · · · · · · · · · · · · · · ·
		+	$\dashv$					<del> </del>						
							+	<del>                                     </del>						
RELINQUISHED BY: (SIGNATURE) DATE	TIME RELINGUISHED BY:	GNATURE)			DAJE /	)6 18	ME 9.175	1200	QUISHE	M:	lla	iE)	DATE 07.00	TIME 18:45
7/5/06 7/5/06	TIME RECEIVED BY: (SIGNATURE)	Álla	227		DATE 7/5/0		ME 21/5	RECEI	VED BY				DATE	TIME
RECEIVED FOR LABORATORY BY DATE (STORY RESPONDED TO THE R	TIME: CUSTODY INTACT YES ONO:	CUSTODY SEAL NO	DRY US	STL SA LOG N	vannah 187	5 <b>4</b>	BORATOR	Y REMAR	KS					STURZANARO (12/072)

SEVE			_	and Chair	N OF CUSTODY R	ECO	RD	Q	510	. <b>Savar</b> 2 LaRo annah,	che Av						Website: Phone: ( Fax: (91	(912)3	stHnc.com 54-7858 1-0165	m ,		
SEVE	NΤ	51	با		• •				⊃ Alte	rnate L	aborato	ory Nan	ne/Loc	ation			Phone: Fax:				·	
PROJECT REFERE			PROJECT NO.		PROJECT LOCATION (STATE) TL		MATRI TYPE					RE	QUIRED	ANA	YSIS				PAGE		OF /	
STL (LAB) PROJEC	CT MANAGER	·	P.O. NUMBER		CONTRACT NO.						<u> </u>	ચુ		П	J	12	'(a.	Γ_	STANDA	RD REPOR	IT C	7
CLIENT (SITE) PM	<u>puilizia</u>		CLIENT PHON	ic .	CLIENT FAX	- 5		ENT.	85	20	7	CARC	350.	₹).£	\$	1	Ž,		DELIVE		<b>\text{\$\pi_{\text{q}}}</b>	
Bob Bill	lman		314-42		3/4-429-0462	8		SOLV	-7360B	&	511	lang	~	ŠŠ	W.	13	3:			E DUE		-
CLIENT NAME URS Core	o ration		CLIENT E-MAI			GRAB (G	Ω	AUR NONAQUEOUS LIQUID (OIL, SOLVENT,)	VOC8.	SVOCS-PAIOC	HERB-8151A	Metals, Manganese	Amonia-	Nitrate, Vitrate	Mothere, Ethane	Ethene Sulfate, Chloride	Carton Dioxide, Alkalinito	705	DELIVE (SURCH	IARGE)	" 🔾	
CLIENT ADDRESS	S Iande Pl	lan - Dula	W 54	300 51	1 - Ma 62110	S S	S	13	>	2		7	#	≥≥				1		TE DUE		=
	·	WORK (if appli	cable)	300 07,	Lows, MO 63110	POSITE ((	O OR SEL	NOUEOUS	HC.	Mone	10.4	<b>2</b>	, <del>,</del> ,	7 Z		, o	No Re	ИСІ		R OF COOL IPMENT:	ERS SUBMIT	TED
SAMPL DATE	.e Time	ļ	SAMPL	E IDENTIFICATIO	NC	COM	200	A S			NUM	MBER O	F CONT	AINÈR	S SUB	VITTED				. REMAI	RKS	ı
7/5/06	0940	≤A8	-MW-1	- M			(		3	2	2	1	1	111	3	1	17	1				
1	0740		-MW-L				7	$\top$	3	a	2	1	1	11	3	1	7	1				
	1156	1	-MW-1-				X		3	a	a.	1	1	11	3	1	1	1				
			- TB-1				d		X		-				1	1						$\neg$
	1510	54	2- MW- 3	2_M	······································		X		3	2	2	1	. 1	11	3	1	1	1		<del></del>		7
				ــــــــــــــــــــــــــــــــــــــ		11	1	1.		-	-	-		-	1	-	-			<del></del>		
		·	·			11	$\top$								-	1	1					
						11	H	1														
							П								T				5,	8/40		
						П	$\prod$											Vi	P	//	12.9	
							П															7:
							,								1		1	1				$\exists :$
RELINQUISHED BY	Y: (SIGNATURE)		DATE 7-5-06	TIME 1740.	RELINQUISHED BY: (S)	<i>*</i>	E)			0ATY 7/5/	106	TIME 18!1		1/1	il	M.	(SIGNATUR	RE)		ate 705006		
RECEIVED BY (SIG	NAMES L		715/06	TIME 17:40		ملا				375	06	TIME /8.1	15-	ÆC	EIVED	: (SIGN	ATURE)			ATE	TIME	
RECEIVED FOR LANGE ATURE TO A STORY ATUR	BORATORY BY		date 270624	TIME OPLD	CUSTODY INTAGT YES NO.		RATO TODY L.NO.		STLS LOG N	AVANNA IO.	н 156	LABOR	ATORY	REMA	RKS							

SEV			•	OF CUSTODY R	ECO	RD	Þ	<b>STL</b> 510 Sav	2 LaRo	nnah oche Av GA 314	enue 104			-	PI	hоле: (	(912) 3	stl-inc.com 154-7858 1-0165			
TR	ERN ENT	5	LL						⊃ Alte	rnate L	aborat	ory Nan	ie/Loca	ation	-		hone: ax:				
PROJECT REFE			PROJECT NO.		PROJECT LOCATION (STATE)		AATRI					RE	QUIRED	ANALY	SIS		*		PAGE /		OF,
STL (LAB) PRO	Area a DJECT MANAGER		2156161 P.O. NUMBER		CONTRACT NO.	<del>                                     </del>					-	<del></del>		Τ.			3		STANDARD RE	PORT .	
Lydia Go	uilizia		1.0. HOWOEN		GOITHOUT NO.	빌		SOLVENT	-82608	THOC	12	Š	S	لع لام	3	12	<b>¥</b>	١.	DELIVERY	7	<b>\$</b>
CLIENT (SITE)	PM		CLIENT PHON		CLIENT FAX	월		国	9	7,	94	2	Š,	કે. ક	£ .	غ	17	ļ	DATE DUE		
CLIENT NAME	Himan Vec	nstra	314-424-		314-429-0467	8		ાકા	, 00	1	×	ž		⋾⋜	W 2	Ó	1		EXPEDITED RE	PORT	
URS Co			CLIENT E-MAI	<b>L</b>		RAB (		틸	X	SVOCs-	Hettide-1151A	Metals, Mayange	Amendia -350.	Nitrate/Nitrite	Mathane, Ethans Ethene	Sulfate, Choride	art on Disorde/Alkalin	707	DELIVERY (SURCHARGE)	<	Ο.
CLIENT ADDRE	SS	<del></del>	ـــــــــــــــــــــــــــــــــــــ	<del></del>		8 8		를	800	× ×	_3	ফু	3	취후	7	3	1	<b> -</b>	DATE DUE		
COMPANY COM	NTRACTING THIS	<b>Dr. West</b> WORK (if appl	<b>Stz. 300</b> icablel	st. Louis,	MO 63110	COMPOSITE (C) OR GRAB (G) INDICATE	OR SEMIS	NONAQUEOUS LIQUID (OIL, S	Kc	7	1	l conyr	, 88. J	205.	2	3	Ponc	HC2	NUMBER OF C PER SHIPMEN	OOLERS S	SUBMITTED
SAM DATE	IPLE TIME		SAMPL	E IDENTIFICATIO	N .	COMP		NONAC	*	<del></del> -		MBER OF						•	RE	MARKS	
7/6/06			TB-1	1/			(		X					1							
	1005	5 <i>A</i> 2	-MW-2	•					3	2	2	1	1	111	3	1	1	1			
	1005		- MW-2		· · · · · · · · · · · · · · · · · · ·				3	2	a	1	1	117	3	1	1	1			
	1005		-MW-2		)	X			3	2	2	1	7	11.1	3	1	L	1			
	1330		- MW-2						3	G	2	1	1	117	3	1		1			
上	1600		- MW-8-						3	7	a	1	1	11	3	1	1	1			
		·											7								
	-	<del></del>		<del></del>	· · · · · · · · · · · · · · · · · · ·	-															
					W	4		+													
																		4			
RELINQUISHED	BY: (SIGNATURE)		DATE	TIME [	RELINQUISHED BY: (SIG	NATI IDE	$\prod_{i}$			DATE		TIME		REUM	CHUKHE	D RAS IS		(F)	DATE	7 17	IME.
p project	1.26 (1.31)				تراسار	A				7/6/	106	171	لِرسو	12:11	T/: /		~ / /	سنست	7/6/	/	7150
RECEIVED BY: (			DATE .	TIME	RECEIVED BY SCHOOL					DATE	106	TIME		RECEI	OZD BY	: (SIGNAT	TURE)		DAJTE	T	IME リアンション
Rehad.	10000	11/0-	01-060	1830		LABO	RATO	RÝ.US	ECONLY	We y	Ø#134	4 7		42.00	30.45			FOR SE		A4 33	
RECEIVED FORM	7//\		07070G	pgvo	CUSTODY INTACT YES O NO O		TODY NO:		STUS LOGN	WANN O	* 3/37	LABOR	ATORY	REMAR	KS,	<b>V</b> S					
7100	1 //	,		2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	manufacture of the Control of the Co	g: 757631			W.O.D	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		10° 1 - 2'11'				4 1 1,41				STL82	40-680 (12/02)

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECOR	RD (	/ 510	Savannah 2 LaRoche annah, GA 3	Avenue				Pho		12)3	stHinc.com 54-7858 -0165
TRENT DIL		Alte	rnate Labor	atory Nar	ne/Loca	ition		Pho Fax	one:		
1549 - 0603 = 2/3   2/5/1/89   (STATE)   T	IATRIX TYPE			ßE	QUIRED	ANALYS	SIS				PAGE OF
STL (LAB) PROJECT MANAGER P.O. NUMBER CONTRACT NO.		N S	8270C	Oaks	100	124	28	Core	2.40	Š	STANDARD REPORT DELIVERY
CLIENT (SITE) PM CLIENT PHONE CLIENT FAX		SOLVE)		\$ 8	83	3/2	3, 3, 5 3, 3, 5, 5	3	25.5	1 .	
STL (LAB) PROJECT MANAGER  P.O. NUMBER  CONTRACT NO.  LIENT SITE) PM  CLIENT SITE) PM  CLIENT FAX  CLI	2	VACs &	SVOCS	Metals Mongoas	Americ-350.	Nitrak Nitrak	E HE	Sultate Mone	(00)		EXPEDITED REPORT DELIVERY (SURCHARGE)
COMPANY CONTRACTING THIS WORK (if applicable)	SEIMISO	31 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7			1,02.8V		<u> </u>			~ <b>1</b>	NUMBER OF COOLERS SUBMITTED
COMPANY CONTROL THIS WORK (II applicable)	0 08	AQUEOU /	1000	F	7	100g	190	7 1	36	7	PER SHIPMENT:
SAMPLE SAMPLE IDENTIFICATION	S Æ	<u> </u>	N	UMBER O	F CONT	UNERS S	SUBMITT	ED			REMARKS
7-6-06 0945 SAZ-MW-4-NG		13	3 3		1	111	3	1	1	114	
7-606 1345 SA2-MW-4-3	<del></del>	3	2 2		1	11	3	-{-	/	14	
7-6-06 1550 592-MW-3M-FB	4-1-1	3	26							<del></del>	
7-6-06/535 5A2-MW-10M-FB X		3	20	7				_			
								-	-	حــــــ	
		<del>   </del>					-,-		-		
				-							1 1
											5.9/1.6/2.6
	Ш					_				TE	MP. /
	$\square$				,	-					2,2
RELINQUISHED BY: (SIGNATURE)  DATE  TIME  RELINQUISHED BY: (SIGNATURE)  Add Class		_1	DATE 7/6/00	TIME	, 5-	RELING	UISO	BY: KK	PATURE	<u> </u>	DATE / TIME 7/6/06 1785 0
RECEIVED BY: ISIGNATURE)  DATE  TIME  REGENERATURE)	244		1606	TIME (7/	5	RECONV 1/h	ED BY:	SIGNATUI	REI		7/606 750
	RATORY I FODY . NO.	LOGN	AVANNAH		RATORY	REMARK	is '		•	·	
χ - ' ν ' '								-			STL8240-680 (12/02)

SEV	ERN	-		NIN OF CUSTODY R	EC	ORI	D	<b>X</b>	'510		nnah oche Av GA 314						F	hone:	(912)	.stHnc.com 354-7858 2-0165		
	ENT	STL							> Alte	rnate L	.aborat	ory Nan	ne/Loc	atio	n			hone:				
PROJECT REFE Solutia	RENCE	PROJECT		PROJECT LOCATION (STATE)	Τ		TRIX PE			,		RE	QUIRE	D AN	ALYSI	S				PAGE	OF /	
STL (LAB) PRO.	JECT MANAGER	P.O. NUM		CONTRACT NO.			Ť	T-:			3	ي	=	J	<u> </u>	4		T		STANDARD RE	PORT	
CLIENT (SITE)	uilizia	CLIENT P	HONE	CLIENT FAX	NDICATE			ENT.	82608	20	38	5	350.1	7	권	E,	13	2		. DATE DUE	) <b>A</b>	
Bob Ve	unstra	_		CLICITI FAX	8			S	82	20	0	3	Ţ	13	\$	\$	3	Dioxide/	-	EXPEDITED RE		
URS C	ormootien	CLIENT E	-MAIL		GRAB (G)	_	2	NONAQUEOUS LIQUID (OIL, SOLVENT,)	Vacs-	SVOCS-8270C	Hericides-815/A	Metals, Maganese	Ammonia	Nitrade/Nitrite	White With A	Methang Ethane, Eth	Sultate, Chloride	Carben Dies	707	ו הבוועבסע	0	•
I CLUENT ANDRE	SS		E. 300 4	+ 1 mile Ma 63116	3 5	A LEGIS	52	S	<u> </u>		<del></del>				3	ž	<del></del>		-	NUMBER OF CO		
		WORK (if applicable)		ot. Lows, Mo 63110	COMPOSITE (	SOUS CA	AIR	AGUEOU	#C	None	20.	ે. ફું	<b>3</b>	H. Se.	200	Sobic	Š	1000	3	PER SHIPMEN		11120
DATE	TIME	SA	MPLE IDENTIFICA	ITION .	COM	힣	3 8	8			NU	MBER OF	CON	TAIN	RS S	UBM	ITTED			RE	Marks	
7/7/06	0355	5A2-M	M-3-M			X			3	2	2	1	7	1	$7 \square$	7	7	1	1			<del></del>
	1110	5A2-MV		***************************************		X	1	$\Box$	3	2	2	,	1	1	7	T	1	1	1			
1	1110	5A2-M	W-3-S.	- D	$\top$	χT	╁	П	3	2	Э	7	1	1,1	7	<u>.</u> .j	1	,	1			
1	1415	592-M4				V	$\top$	$\Box$	3	2	a a	,	1	1,1		<u>,                                    </u>	1	1	1		<del>~</del> -	
	110				$\top$	+	+	11		-	-				1		<u> </u>	+-	-			
<u> </u>	1.	<del></del>			$\top$	7								П	_		<del>                                     </del>					
ļ		<del></del>	<del></del>		H	+	+-	11				.		H	七			-				
<u> </u>					$\dagger \dagger$	$\dashv$	-	+						╀┩	7		$\vdash$		1			<del></del>
<u> </u>					+	+	+							Н	+		١,	1	1.78.	AND	1	<del>.</del>
	<del>  </del>	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		+	+	+	M	E	_				H	十		<del>                                     </del>	11	١W	7.3.3	2-6/1.6/	7.4
<u> </u>		<del></del>			+	+	+	11			<del> </del>			H	┰		├─	-	<del>                                     </del>			
					+	+	+	H						$\forall$	+		<del>  ,                                   </del>	-	<del>                                     </del>			·
RELINQUISHED		DATE	TIME	RELINQUISHED BY: (SIG	SNATU	RE)	_ <u>_</u> 	ш		DATE 7/7	/06	TIME 151	15					SANAYU	RE)	DATE	15.5 15.5	
RECEIVED BY:		DATE	TIME	RECEIVED OF ISIONATE	H	·				DATE	1	TIME	<u>~</u> ~6	RE	SFIZE W	36	(: (S)GN/	nd for	<del></del>	DAYE /	TIME	
agains a co				BULLO						2/1	186	15	15		Ni	汉	$\mathcal{I}$	Mhs		7/7/0	6 15:5	4
RECEIVED FOR I	LABORATORY BY	# <u>1 - 67-67</u> G DATE - 1 - 1 - 1	6 620 6 0838	CUSTODY, INTACT		ORA STO AL N			STLS LOGN	AVANIN, 10 18)	и 56	LABOR	ATORY	REM	ARK:	S	75					

	SEVERN		•	AND CHAIR	OF CUSTODY R	ECC	ORD			02 LaRo	nnah oche Av .GA 314					P		912) 3	stl-inc.com 354-7858 2-0165		
	TRENT	ST	L						⊃ Alt	ernate L	_aborato	ory Nan	ne/Loc	ation			hone:				,
	PROJECT REFERENCE		PROJECT NO.	683	PROJECT LOCATION (STATE)	1	MAT	PΕ			•	RE	QUIRED	ANAL	YSIS		•		PAGE /		OF/
7	STL (LAB) PROJECT MANAGER BOD VRYSTY CLIENT ISITE) PM L. J. J. Guiliz. CLIENT NAME US (D.P) CLIENT ADDRESS (OO) HILMONDS NO	5	P.O. NUMBER CLIENT PHON 314 429 CLIENT E-MAI	Ε . <i>0/00</i> L	CONTRACT NO.  CLIENT FAX  314. 429.0462	) OR GRAB (G) INDICATE	TER)	AR MONTON FOUNDATION CONTENTS	VO( - 62/22	SVOC-8226C	Kréici	Meds, Magae	(Insource)	Witch ditch	135	Sulfate, Chlorido	Coba Digital	70C	STANDARD REDELIVERY  DATE DUE  EXPEDITED REDELIVERY (SURCHARGE)  DATE DUE	EPORT	0
ľ	COMPANY CONTRACTING THIS	S WORK (if appli	cable)	) 1/4 CA	117, pr(V 6) 110	OSITE (C	OUS (WA	9 0		1	non	can,	less	3 5	ह	10h	uon	HCL	NUMBER OF C PER SHIPMEN		SUBMITTED
	SAMPLE DATE TIME		SAMPL	E IDENTIFICATIO	NC	S					NUN	IBER OF	CONT	AINER!	SSUBM	TTED			R	EMARKS	
	7-7-06 0900	SA2-1	nw-101	M			χ													١.	
ľ	7-7-06/09/20	SA 7 -	mw-1	00	····	$\perp \downarrow$	×_		3	ಎ	2	1	1	11	3	(		1	<u> </u>		
	7-206 1120	SA2-1	nw-10	)-S			<u> </u>	Ш	3	a	a	1	1	1 1	3	1		1			
1	7-7-64 1120	S618-1	W-10	-S-MS			XI_		13	2	ચ		1		3	1					
-	7-7-06/180	SAQ-M	W-10	<u>S-M3</u>	Δ		<u>A</u>	Ш	3	2	2	1		11	3	1	1	1			
	7-7-04	T	<u>B -/2</u>	···	<u> </u>			Ш	X												
			·			$\coprod$															
ŀ		· · · · · · · · · · · · · · · · · · ·	·-···			廿	1		]	ļ				- Cal.	N 10 30	_	0/		1	<u> </u>	
-					OK.	++	-	$\parallel$		<u>                                     </u>		'	11		II.	à.	2/2	16/1	6/1.4		
				····		$\sqcap$		$\top$													
						$\prod$	7	$\prod$		<u> </u>							ا ر	1			
	RELINQUISHED BY: (SIGNATURE)		DATE	TIME	RELINQUISHED BY: (5)	NATUR	RE)			DATE 7/7	106	TIME 15	15	RELI	guisa	"	U,	E)	DATE 7/7/6	6 1	ME 5.54
L	RECEIVED BY: (SIGNATURE)	,	DATE	TIME			_			DATE 7/7	106	TIME 15:1	5	RECE		: (SIGNA	TURE	<u></u>	DATE	I TI	ME 5 15 4
R	PC Q Y Y Y ECEIVED FOR LABORATORY/B	Mill	07-0 <i>7-07</i> Date:		CUSTODY INTAGE				ISE ONL		ALL: 1941	LAPOD	ATORY	C//	ONG.		(1) (A)		STATE OF THE STATE		
100	SIGNATURE)		7/8/06	0838	¥¥ 000	SE/	STOU AC NO	52.5		1027 18	ah 154	. CABOR	ALURY)	UC DAW	mo \						

SEVERN	ANALYSIS REQUEST AND CHAIN	OF CUSTODY R	ECOR	D		02 LaRo	nnah oche Ave GA 314					Р		(912) 3	stHnc.com 354-7858 2-0165	
TRENT	STL				⊃ Alte	ernate L	aborato,	ory Nam	ne/Loca	ition			hone: ax:			
PROJECT BEFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)		TRIX YPE				RE	QUIRED	ANAL	YSIS		K		PAGE /	OF
STL (LAB) PROJECT MANAGER L. Q.J.Q. JULIL CLIENT SITE) PM JULIL S CLIENT NAME	P.O. NUMBÉR 7.50  CLIENT PHONE S /4 - 49 4 6/00  CLIENT E-MAIL	CONTRACT NO.  CLIENT FAX  3/4-439-0462	OR GRAB (G) INDICATE ER)	SOLID OR SEMISOLID AIR NOMBOLIFORIS LEVIEN OF SON VENT 1	VOC-8040B	Suc sona	Klicids 854	Myds, llogowse	Jaurona 350.1	Nitak Dikote	Mestigny, Chons,	Sulfak Chloride	action dated Alleding	36	DATE DUE _ EXPEDITED REPORT (SURCHARGE)  DATE DUE _ DATE DUE _ DELIVERY	<del></del>
	Plaza Dr. W. Se SID St. Louis WORK (It applicable)	3/100 (3/10	OSITE (C)	OR SEMI	101	1200	Bi	ig g	620	188 188 188	TE STATE	18	1887	H	NUMBER OF COO PER SHIPMENT:	DLERS SUBMITTED
SAMPLE TIME	SAMPLE IDENTIFICATIO	<b>N</b> .	AQUE	SOLIE SOLIE	A	. 1	NUM	IBER OF	CONTA	INER	S SUBM	TED			REM	ARKS
7-10-0	TB-13		X		X	X	X				X				ĬŞ.	
7-10a 1030	SA2-MW-6-M		X		3	2	2	1		11	3	1	(	1		
7-10-06 1030	SA2-MW-6-M-8	Sup	X	11	3	3	3	1		41	3	1		1	<u> </u>	
7-10-04/500	SA2-MW-6-D	1	X		3	2	2			111	3	1		1	ABILL	
				44	ļ	ļ						<u> </u>			66	
		<del></del>		4	<u> </u>						ļ	<u>                                     </u>				
				#		<u> </u>						1	<u> </u>	<u>.</u>		
			1 14	71	<u> </u>						-	ļ			5/20/	<u>/</u>
		· ( )(K		4+	<del> </del>						<del> </del>	<del>                                     </del>	-	EN	8/2.9	///
				++	<del> </del>		$\rightarrow +$				┼	<del> </del>		L1V		27
		/														
RELINQUISHED BY: (SIGNATURE)	17:00 TIME	RELINQUISHED BY: (SIG	AATURE)			DATE	/2.	TIME 17:	44.7	RELI	VQUISHI	ED BY: (	SIGNATUR	E)	871000	TIME
PECENT PHECOMULE	DATE TIME 17:00	BEGEIWED BY: (SIGNATUR	روا	h	<del></del>	BATE!	7	TIME 17:1		RECE	EIVED B	Y: (SIGNA	TURE)	ar.	DATE	7805 TIME
RECEIVED FOR LABORATORY	DATE TIME	CUSTODY-INTACT:	LABOR,	ATORYA DDY	SE ONG	AVANNA	106 H	14.034		REMA	RKS					
SIGNATURE)	OPUBLIFIELS		SEAL	DDY NO:	INLOG I	101:23	7	经现代的	# 44 A TA	1.0						

SEV	ERN		QUEST AND CHAIN	OF CUSTODY R	ECC	RD	\$	510	Savar 2 LaRo annah,	che Av					P		(912) 3	stHnc.com 54-7858 -0165		
	ENT	ST		٠				⊃ Alte	rnate L	aborato	ory Nam	e/Locat	ion			hone:				
PROJECT REFE	RENCE Area 2		JECT NO. 1561683	PROJECT LOCATION (STATE)		MATR .TYPE				<del>,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,</del>	REC	UIRED /	NALYS	SIS				PAGE /		OF f
STL (LAB) PROJ	ECT MANAGER	P.0	. NUMBER	CONTRACT NO			1	90	20	514		0	la la	ne,	8	2		STANDARD RE DELIVERY	PORT	<b>X</b>
Lydia ( CLIENT (SITE) F Bob Vee	M		ENT PHONE 1-429-0100	CLIENT FAX 3/4-429-0462	(C) INDICA		SOLVEN	80768-	(C)	/8-æ	1656	1.05-1	Ž	P.	Chlan	Diox	_	DATE DUE		
CLIENT NAME	onporation	CLI	ENT E-MAIL		12	orio Outo	JUD (OIL,	VOCs-	subcs-8apac	Herbides-8151A	Metals, Mangan	Amoria -50	Nitrate, Nitrite	Mcthane, Ethene	Suffete, Chloride	Carton Dioxidy Alkalinity	705	EXPEDITED RE DELIVERY (SURCHARGE) DATE DUE	• • • • • • • • • • • • • • • • • • • •	0
COMPANY CON	hlands PL TRACTING THIS	aza Dr. W. S. WORK (if applicable	te. 300 St. Loui	s, MO 63110	COMPOSITE (C) C	SOLID OR SEMISOLID	AIR NONAQUEOUS LIQUID (OIL, SOLVENT,	На	nore	nore	¥.	¥,	2 0 0	3	٠ 2	Panc /	HCL	NUMBER OF CO PER SHIPMEN	OOLERS	SUBMITTED
SAMI DATE	PLE TIME	· · · · · · · · · · · · · · · · · · ·	SAMPLE IDENTIFICATION	N .	S S	SOLID	NONA			NUN	MBER OF	CONTAI	ERS :	SUBMI	ITED			RE	MARKS	
7/10/06	0950	SA2.	-MW-9-D			X		3	2	2	1	1 1	1	3	1		1			
1	0950		Mw-9-D-D			X		3	2	2	1	1 1	1	3	1	1	1			
	1430		MW-9-M	······		ΧĹ	_ _	3	2	2	1	11	11	3	1_	1_	1			
<u> </u>	1540	SA2-	MW-9-3	· · · · · · · · · · · · · · · · · · ·		<b>X</b>	-	3	1		_		-	3	-	_	=			
		· ·		· · · · · · · · · · · · · · · · · · ·	H	$\top$						$\neg \dagger$				-				
						1	15	C												
					+	,			-			-	-		 	-				
RELINQUISHED	BY: (SIGNATURE)	DA1	1906 17:00	RELINGUISTO BY 19		<del>  </del>			2/1/2	OL	J. 4.	5	RELINO	UISHE	D BY: (	SIGNATUR	<u></u>	DATE 07/0	. )	TIME 1885
MIN	A ARE	, 3 (DA)		REGEIVED BY: (SIGNATUR	(E)	li			DATE //O/		TIME 17:9	] ]	ECEIV	ED BY	(SIGNA	TURE)		DATE		TIME
RECEMPO FOR I	ABORATORY BY	10 DAT		CUSTODY: INTACT YES ON		ORATO STODY NE NO			AVANNA O		LABOR/	YTORY R	EMARK	\$						

SEVERN	ANALYSIS REQUEST AND CHAIN	N OF CUSTODY R	ECOF	D	<b>/</b> ~'5	<b>TL Sava</b> 102 LaR avannah	oche Av					F		(912) 3	sti-inc.com 54-7858 -0165	
TRENT	STL				( A	ternate	Laborate	ory Nan	ne/Loc	ation			Phone:		<u>:</u>	
PROJECT REFERENCE	PROJECT NO.	PROJECT LOCATION (STATE)		ATRIX YPE				RE	QUIRED	ANAL	YSIS				PAGE /	OF 
STL (LAB) PROJECT MANAGER	P.O. NUMBER	CONTRACT NO.	빌		- 9	3/8	1/2		/0	4	3	acap	3,2		STANDARD REPORT DELIVERY	\$
CLIENT (SITE) PM Deenst	CLIENT PHONE	CLIENT FAX	INDICATE		SOLVENT,)	-830C	62	128	33	77		Ma	Z	)	DATE DUE	
CLIENT NAME  URS Caco	CLIENT E-MAIL		(G)	Q	히*	Succe	HE Greids STSH	Metals, Monogoese	MINICOLO	护		Sulfit, C	Caten Docto	B	EXPEDITED REPORT DELIVERY (SURCHARGE)	0
CLIENT ADDRESS	ea Dr. W. St 300 St. Louis	MO BIO	(C) OR	MISO	S	7 12	7	- S	Men	3	0		3	1	NUMBER OF COOLERS	SHRWITTED
COMPANY CONTRACTING THIS	WORK (if applicable)		COMPOSITE (C) OR GRA AQUEOUS (WATER)	SS SS		SS	8	3	<b>63</b>	8 8	18	302	18	160	PER SHIPMENT:	
SAMPLE DATE TIME	SAMPLE IDENTIFICATION	)N	AQUE	SOLID	NONA	·—,-	NUM	MBER OF	CONT	AINER	S SUBM	ITTED			REMARKS	
7-11-06 1030	SA2-MW-5-0		X		2	'   " ' '	2	{	(	111	3		1	1		
17-11-de 1232	8A2-NW-5-5		X		3		a		Ţ	11	3	1	1	1		
411-06 1530	9A2-Mus 5-M		X		3	a	2			11	13	1	(	1		
7-11-do	13-14				3								-		,	
											-	-	<del> </del>			
				++	+=	#					+	ļ	ļ			
		THE			+-	-					-		-		·	
												· -				.4
					•								1	EIV	P./	
	T 20 200	AA .		Ш	<u> </u>			20.42		DE1 11		-				Will are
RELINQUISHED BY: (SIGNATUP)	DATE TIME 7/11/06 /7:15	BELLEVISION BY (SIG	T			DATE	11/06	18	00	m	nB	M	(SIGNATUR	E)	07.11.06 1	TIME 830
RECEASED AND SCHOOL SON	2/11/06 TIME 17:15	RECEIVED BY: (SIGNATURE)	les_			DATE 2//	//oį	TIME	O	ÆECE	IVED B)	: (SIGNA	ATURE)		DATE	TIME
RECENED FOR LABORATORY BY (SIGNATIVE)	///   DATE   TIME	CUSTODY/INTACT YES O	LABOR CUST SEAL	ODY		ILY SAVANIN NO 80/8			ATORY	REMA	RKS:					
The second secon	Control of the Manager Asset Control of the Control	gregorianske til ett som en fram fil kopfatte fil 18. f. (1	gypter ett			20116	مطوبهت	\$154.WEED	elentiten.	~170°E	ap(1491519 -	and the second	no jedanivinis	r <u>(4)</u> 130999	STL8	240-680 (12/02)

SEVER		·		N OF CUSTODY R	ECOI	RD	À	• DIU.		i <b>nah</b> che Av GA 314					-	Phone:		sti-inc.com 54-7858 -0165		
TRENT	T	STI	_					⊃ Alter	nate L	aborate	ory Nan	ne/Loc	ation	)		Phone: Fax:				
PROJECT REFERENCE Solutia Area	<u> </u>		CT NO. 56/683	PROJECT LOCATION (STATE)		ATRIX TYPE					RE	QUIREC	) AN	ALYSIS				PAGE /		OF /
STL (LAB) PROJECT MA	ANAGER		UMBER	CONTRACT NO.	ш	П	7	Ø		7		-		واه	و	Τ.	T	STANDARD DELIVERY	REPORT	<del>/</del>
Lydia Guilia CLIENT (SITE) PM	ZIA		T PHONE	CLIENT FAX 3/4-429-0962	DICAT		VENT	VOCS-8360B	SVOCS-8770C	Herbiddes-8151A	ž	-350.	3	Methane, ethane	Sulfate, Chloride	Carbon Dioxide,	<b>↓</b> ·	DATE	OUE	
Bob Veenstr CLIENT NAME	ra	314-4	129-0100 FE-MAIL	314-429-0962	N)		ଞ୍ଚ	00	8-	les	aMe	-8	ž	Z.,	ু ঠ	67		EXPEDITED DELIVERY	REPORT	_
1185 Caroara	tion				SRAB (		D (Off	2	2	bicie	Metals, Mansonese	Ammonia-	Nitrate, Nitrite	केंद्र	Sulfate,	200	5	DELIVERY (SURCHAR	GE)	0
CLIENT ADDRESS	/ //	Λ <i>ν</i> / σ	L >	63/10	88	SOLL	ES	7	5/	Her	Ma	Am	ž	ZZ	X 0	25	F	DATE	OUE	
CLIENT ADDRESS 1001 Highlan COMPANY CONTRACTIN	NG THIS WO	DRK (if applicable)	72. 300 S	CONTRACT NO.  CLIENT FAX  3/4-429-0462  63/10  The Louis MO	OSTTE (C	OR SEM	QUEOUS	Ha	79ge	79.C	100°	Tos o	S S S S	5	15	1 S	75	NUMBER O PER SHIPM		RS SUBMITTED
SAMPLE TIM	ME		SAMPLE IDENTIFICATI	ON	AOUE	SOLIC				NUN	MBER OF	F CONT	AINE	RS SUBI	AITTED				REMARK	s
7/11/06 093		SAZ-MW-	9-5		X	$\sqcap$		_	(1)	2			-		T-	_	-			
112			7-M-FB	<b></b>	Ìλ	1	$\prod$	3	ر م	ゑ	1	1	1	1 3	$\top_{I}$	1	1			
143		142-MW-			K			3	2	٦	1	1	1	13	1	1	/			
160		542 - MW -			X			3	ス	2	1	1	1	13		1	1			
															_		<del> </del>			
7/11/06	•	TB-15	(Recei	ved w/sauda	X			<b>/</b>						-			<u> </u>			
			ل	Punia 7/12/06										_						
				1+1	<u>-                                    </u>											<u> </u>	<u> </u>		·.	
	·····			MEC												<u> </u>	ļ			
							$\perp \downarrow$						Ц	_			<u></u>			
			······································				-						Ц	_	<u> </u>	<u> </u>				
RELINQUISHED BY: (SIG		1 5175	Tibar	T == 1100 PA					2024		7045		55	INQUISI		<u> </u>	<u> </u>		<del> </del>	
RELINQUISHED BY. (SIG	alt	- DATE	106 17:15		MATURE.	<del></del>		į	DAYE <b>7///</b>	he	TIME	00	NEI	WE	Mi	SIGNATO	IRE)	DAT OT:	11.05	TIME 1830
RECEWED BY ISIGNATUR	1	399	106 17-15	RECEIVED BY: (SIGNATURE)	E) Le				DATE/	11/06	TIME	00	RE	CEIVED E	Y. (SIGN	ATURE)		DAT		TIME
RECENED FOR LABORA	TOOK DIE	M	LYDE	1	LABO		RY US	E ONLY	de de la constante de la const		LABOR	ATODY	OF.	ADVC	An	alyu	- <del>6</del> -	Herbici	le on	
(SKINATURE)		DATE DATE	06 090T	CUSTODY INTACT YES O	CUST SEAL	NO.		STL SA LOG NO	0. 0.	16	LABOR	KATURY	KEN	MKNO •	1831	- 3ve	Car  San	ialysis ipled 8/11	1000	lui debudee cived tlule 8/10/06
<del>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</del>	0			etai	`			· · · · · · · · · · · · · ·		<u>, ,</u>										8240-680 (12/02)

SEVERN	NALYSIS REQUEST AND CHAIN	OF CUSTODY R	ECC	ORD	7	V 510	L <b>Sava</b> 02 LaRo rannah,	oche Av	enue 404				P		912) 3	stl-inc.com 54-7858 -0165		
TRENT	STL					⊃ Alte	rnate L	aborate.	ory Nar	ne/Loc	ation			none: ax:				
PROJECT REFERENCE	PROJECT NO. 2056/683	PROJECT LOCATION (STATE)		MATE			•		RE	QUIREC	ANALY	SIS				PAGE		OF
STL (LAB) PROJECT MANAGER_ Cydsa (401/12, CLIENT (SITE) PM	P.O. NUMBER  CLIENT PHONE	CONTRACT NO.	(G) INDICATE		VENT)	Magarese	13501	Utrik	linic	laride	de/ Marte	>				STANDARD R DELIVERY DATE DU	(	X
CLIENT NAME  URS COCO.	3/4-U39-O(O) CLIENT E-MAIL	34-479-0462	9	9	AIR NONAOUEOUS LIQUID (OIL, SOLVENT	rilet d's mang	macara 3.	Nitolo, Nitrik	Nitrak, Nitrik	Suffer chlands	Cabon dickide/	70C				EXPEDITED F DELIVERY (SURCHARGE	)	0
COMPANY CONTRACTING THIS W	za Dr. W. S. 300 H. Li ORK (if applicable)	OLIT MO 63110	COMPOSITE (C) OR GR/	OUS (WATER) OR SEMISO	OUEOUS LIC	H003 M	My0291	Magh.	7 200	Nove S.	D nou		W£			NUMBER OF PER SHIPMEI	COOLERS	SUBMITTED
SAMPLE TIME	SAMPLE IDENTIFICATIO	N	S		R S			NUN	ABER O	F CONT	AINERS	SUBMI	TTED			F	EMARKS	
7-12-06 1010	SA 2-MW-9-S					1	1	7	1			1						
				$\bot$														
			H	-		-			<u> </u>								<del></del>	
		······································	++												-			
			$\forall$	+	-	_	-											
		····	H	+											, .			
			$\prod$															
													-77	m	華	330		
													<u> </u>	11	-	2.2	'	
	· · · · · · · · · · · · · · · · · · ·	·		$\perp$	$\coprod$													
REUNQUISHED BY: (SIGNATURE)	DATE TIME	RELINQUISHED BY USIG	NA	1		ļ	DAT <b>E</b>	4	TIME		REI IN	OI IIGHE	D BY: (s	ICNATI I	E1	DATE	- السب	TIME
The Appl	7-1200 11:00	BIN		1	<u> </u>		7/6	706	TIME,	00	11	WX	$\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	T.S.	e-	09-12		500
RESERVED BY LISIGNATURE	7/12/06 11:00	RECEIVED BY SIGNATUR	M	L	<u>ا</u>	AP-SARA	DAFE 7/W	106	TIME	08	P/ZCEI	VED BY	: ISIMINAT	UŖE)		DATE .		ПМЕ
RECEIVED FOR LABORATORY BY: (SIGNATURE)	7 3 6 PACT	GUSTODY:INTACT: YES O		ORAT STOD AL NO		CAN DE	AVANNA IO	5.7.32.57	LABO	ATORY	REMAR	KS						
en ment et let y beneg hat die nie gestalende i	a control of the property of the second section of the section of the second section of the section of the second section of the section of t	un e papa muu (Markingi) e	⊕.: ×:	(\$1%)#	ner gerke		(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	n <b>O</b> En E	SAFE TRANS	**************************************	的物面包括	A LEASEN	经数据的	(神经)神经	riskali) (18		STL82	40-680 (12/02)

SEV	E R N			•	AND CHAI	N OF C	USTODY F	REC	ORD	غرا	510		nah oche Av GA 314					P		(912) 3	stHinc.com 54-7858 -0165		
TRE	ENT		T		:						⊃ Alte	ernate L	aborato	ory Nan	ne/Loc	ation			hone:				
PROJECT REFER Solution STL (LAB) PROJ	RENGE	 2	PRO Q	DJECT NO.	83	PROJE (STATE	CT LOCATION		MAT TYP					RE	QUIREC	ANALY	sis ·				PAGE	OF /	- 1
ludia (	(400/17	ia	P.0	. NUMBER		CONTR	RACT NO.			-	Š	2	4	Mongenese	).d	# 7 × 1	3,	ide	8		STANDARD RE DELIVERY	PORT	
CLIENT (SITE) P	Deast	10	3	ENT PHON	)- <i>0/0</i> 0	CLIEN	T FAX 429-046	G INDICATE		SOLVE	83	50	13	nece	-33	2	\$ 3	Choid	20	P.,	DATE DUE		-
CLIENT NAME	_		CLI	ENT E-MAIL				g	_	000	VCLs-824CB	SVCES-8270C	Herb-81514	als He	Ameena	that	hou.	ACK.	Coden Di Altelio	ğ	EXPEDITED RE DELIVERY (SURCHARGE)	PORI	
CLIENT ADDRES	Sahlon	12 F	7/20	Dr4	2 8634	77) S7	(03/100	88	(TER)		Z	<u> </u>		sptops.	A stu	35	30	3	9,	1	DATE DUE		=
CLIENT ADDRES		WORK (if	applicable	1)	·· 0/000		0.\$// <i>O</i>	OSITE ((	AQUEOUS (WATER)	AIR NONAOUFOUS LIOUD IOIL SOLVENT	7,	Mae	3	Sep.	16.20,	\$ 15 \$ 15	20	2	13	7	NUMBER OF CO PER SHIPMEN	DOLERS SUBM	IFTED
DATE	PLE TIME	1		SAMPLE	EIDENTIFICATI	DN		COM	A QUE	NO AR			NUN	MBER O	CONT	ainers	SUBMI	ITED			RE	MARKS	
7/5/06	1459	Sy	12-11	w-	4-0				X		3	2	2	1	1	11	3	1	/	1	*Shi	9 Ane	
			<u> </u>								ļ						<u> </u>				Contain	es ru	rived
		* 1	Ecan		<u> २- १५</u>					$\sqcup$	ļ	ļ								ļ		W TO	
					n over			$\bot$			ļ											mach	
					d to Sr		rectly	- -	$\perp$												AHO: B		<u>nba</u> Y
		to	STL	Sacr	anon	cto		+	_	+	<del> </del>								<u> </u>		716	106	
			nece	:: <u>14: €34</u> :	ER COC	HOH	<u> </u>	+	+	+						1					Drue	Promot	hab
									1				-//	20				•			0		
				JUL -	7 2006				N.	P C	TIS HE	Au.	则处	71	ON'T								
<u></u>									$\cdot$			6			crus	0 1/	le	J					
Dat NOT HOLD TO	24		IN		Z		2		2	<u> </u>						<b>5</b>						) white and	
RELINQUISHED	BY: (9IGNATURE)	<del></del>	I DA	-01	17:40	RELING	ARD BY:	GMATU	JRE)			7/5	106	18!	15-	10	X	Mi	SIGNATUR	RE)	DATE ©7.05		15
MI	SCHOOLS MILES		77	5/06	17-40	RECEIVE	ED BY: (SIGNATI	URE) At 1	l	<u> </u>		DATE 7/37	06	TIME	·5-	RECE	VED BY	ISIGNA	TURE)		DATE 7/7/0	TIME 1/0	0
RECEIVED FOR I	LABOYATORYLE		THE STREET	TO WELL THE	JME 45	A 10 ( 10 ( 10 ( 10 ( 10 ( 10 ( 10 ( 10		THE CAL	SUNA	TORY U Y O	SE ONL	AVANN		LABO	ATORY	REMAR	KS		Manine Marie				
$\nabla U$	N		1	0001	0916	No		2			100	010	154			77.7		25					
	6						<del> </del>		•													STL8240-680	(12/02)



CHAIN OF CUSTODY RECU. \_\_

1. July sucrayitente, 1 +

#### QUOTE#

#### SEVERN TRENT LABORATORIES, INC.

	Information		Project Inf	ormat	lon		:	An	alysi	s/Met	hod	В		14 / 1 2,555			
PO:			Project Nar	me:	SA2 Supp	olemental i	nvestigation	Α	Dioxi	n							
WO:			Project Nur	mber:				В									
Company:			Bill To:					C									
Report to:	1001 HIGHLANDS PLAZA	RIVE WEST	Invoice AT	TN:				TI MI CI									
Address:	SUITE 300		Address:					E									
1	ST. LOUIS MO 63110																
1			ļ					G									
E-mail:		·						Н									
Phone:	314-429-0100		Phone:										Othe	r;			
Fax:	314-429-0562		Fax:		İ		<del></del>	J									
	<del></del>			·		<del></del>		<del></del>								<del></del> -	
No. Same	ple Description	Preservation	Date	Time	Туре	Matrix	# Container	s A	BIC	DE	FIG	SHI	1111	(IL)	MIN	IO	
() — — — — — — — — — — — — — — — — — — —	2-MW-4-M	SEE ANALYSIS/METHODS				Water	7	V			1	++	+++			计计	
	2-MW-4-S	SEE ANALYSIS/METHODS		<u> </u>		Water	1 2	7	-			++	<del>-    </del>			++	-
3 —		SEE ANALYSISMETHODS				Water								<del>†</del>	_	<del>     </del>	
4		SEE ANALYSISMETHODS		<del> </del>		Water	1	-			<b> </b>	╌┼╼┼		1	+	╪┿	
5		SEE ANALYSIS/METHODS	<del></del>			Water				++-		+	++	+	+	++	
26		SEE ANALYSIS/METHODS				Water	<del>}</del>				11	††	11	<del>                                     </del>		十十	
7		SEE ANALYSIS/METHODS				Water					TT	寸寸				1	
8		SEE ANALYSISMETHODS				Water										TI	
9		SEE ANALYSIS/METHODS				Water											
10		SEE ANALYSIS/METHODS				Water					$\prod$		TT			TT	
Sampler:		7	Shipment N	Method	J;		10 -4	/ Da	te Du	ie (fa:	<b>()</b> :						
1. Relinguish	ed by Date 7/6/06	2 Regelved by:		Date:/	106	3. Relino	MARINE			06	4. Re	eseiyes	Yhili			Date	77.711/
Company:	Time: 2 / 7://5	Company: TWILITE EX	0	Time:	15	Company. TWI-L	lit EXI	)	fimé:	وجوا	Com	pany:	S-/.(	10U (	`₹	Time	750
Comments:	Relingipus /	WIR 07.0	06.06		Rec	of By	116 EX/ 17/7/06-			Stand				Oth			
		(0,5			C	Leville,	7/7/06-	-13	20	Rus	1 tur	n					
																	·····

Severn Trent Laboratories, Inc.

5102 LaRoche Avenue

Savannah GA

Phone: 912-354-7858

Fax: 912-351-3673

- Recid 1 of 2 Apr Broken - ev 7/9/6 to



SDG No: SAS044



## DATA VALIDATION .. JRKSHEET VOLATILE ORGANIC ANALYSIS

 Reviewer:
 Tony Sedlacek
 Project Name:
 Sauget - Area 2

 Date:
 7/3/2006
 Project Number:
 21561683.80011

 Laboratory
 Severn Trent Laboratory - Savannah
 SDG No.:
 SAS044

 Review Level:
 Level IV

Major Anomolies:

No samples were rejected

Minor Anomolies:

Analytes in sample NAPL-C-139 were qualified due to surrogate recoveries.

Field IDs:

Soil-Q-21-SS-0.5'

TB-2

NAPL-A-138

TB-4

Soil-Q-21-SB-4'

NAPL-B-34'

TB-1

NAPL-B-139

NAPL-C-31

TB-3

NAPL-C-139

NAPL-A-40

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA.
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,	X		

Note:

The laboratory case narrative indicated acetone was detected in method blank 680-44940/7. Surrogates 4-bromofluorobenzene and toluene-d8 were outside evaluation criteria in sample NAPL-C-139. The internal standard chlorobenzene-d5 recovered outside QC limits in sample NAPL-C-139 Chlorobenzene was detected at 290 µg/L in sample NAPL-C-139 the results were high biased due to sample carry over in the preceding sample. The sample was reanalyzed with a result of 33 µg/L.

#### 2.0 Holding Time/ Preservation (Code H)

				·		Yes	No	NA
2.1	Do sample preservat	tion, collection and stor	age condition meet me	thod requirement?		X		
	If sample preservation	on and/or temperature v	vas inappropriate (i.e.,	<2° >6°C, etc.), commer	nt in report. If			
	unpreserved or temp	erature is outside the ra	ange 0° (but not frozen)	) to 10° flag all positive	results with a			
	"J" and all non-detec	cts "UJ", If temperature	e exceeds 10°, flag pos	itive detections "J" and n	on-detects			
2.2				ate of analysis, been exce		x		
	Matrix	Preserved	Aromatic	All others		· · · - ·		
	Aqueous	No	7 days	14 days				
		Yes	14 days	14 days				
	Soil/Sediment	$^{\circ}$ C ± 2 $^{\circ}$ C	14 days	14 days				
2,3	Have any technical l	holding times been gro	ssly (twice the holding	time) exceeded? If yes,	J(+)/R(-).		公上X 海南	·

Note: Sample TB-1 was analyzed approximately two hours outside of holding time. All analytes were non-detect, and the sample was a trip blank, therefore no qualifications were required.

lof5

#### GC/MS Instrument Performance Check (Code T)

		Yes	NO	INA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	X X		
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	X.		
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	XC		

Note: All tuning criteria was met.

#### 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	W.X		
4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?	х	がはない	
4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?		X	
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride,			
	acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated			
	to the RL for estimate (laboratory "J" flagged) concentrations.	ļ		
4.4	If Level IV, review raw data and verify all detections for blanks were reported.	X		

Note: Method blank 680-44940/7 had a positive result for acetone. All samples associated with this method blank were non-detect for acetone, therefore, no qualifications of data were required. All raw data was reviewed and acetone was verified in the method blank.

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	NO	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	Z X		;
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01			
	for poor responders like ketones or alcohols)? If yes, J(+)/R(-).		∵/x	l
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	14. X 75.		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	Х		

Note: Initial calibration was within evaluation criteria. Recalculations of the RRFs and %RSD were performed, and no errors in calculation were noted.

#### 6.0 Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	2 X 2		
6.2	Has a continuing calibration standard been analyzed every 12 hours?		X	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	X		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial			
	and continuing calibration RRF outside QC limits (%D < 20%)?		X +	
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For			
	%D > 50%, flag R.		1	
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X	
6.6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.	Х		

Note: A continuing calibration standard was not analyzed every 12 hours because samples were not all analyzed on the same day, although all samples were analyzed within 12 hours after a standard was analyzed. Continuing calibration compounds met criteria.

Recalculations of the RF and %D for one compound per standard were completed, and no errors in calculation were noted.

#### 7.0 Surrogate Recovery (Code S)

				Yes	No	NA
7.1	Are all samples listed on the appropriate	e Surrogate Recovery S	ummary Form ?	Y X		
7.2	Are surrogate recoveries within accepta	nce criteria specified in	the QAPP for all samples?	<b>43.175</b> .75	X	
7.3	If No in Section 7.2, were these sample(	s) or method blank(s) re	eanalyzed?	х		<u> </u>
7.4	7.4 If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted					1
	out.)					x
	Note: If SMC recoveries do not meet a	ceptance criteria in sam	ples chosen for the MS/MSD	or diluted		
	> UCL	10% to LCL	< 10%			
	Positive J	J	Ĵ			
	Non-detect None	UJ	R			

Note:

The surrogates 4-bromofluorobenzene (64%) with criteria (65-128%) and toluene-d8 (49%) with criteria (68-121%) were outside of evaluation criteria in sample NAPL-C-139. This sample was reanalyzed and surrogate 4-bromofluorobenzene was outside of evaluation criteria. All detected analytes were qualified as estimated "J" and all non-detected analytes qualified estimated non-detect "UJ". The data used as part of this validation for sample NAPL-C-139 is from the reanalysis. The original analysis data is not intended for use.

Field ID	Analyte(s)	Qualification	Code	Justification	Run #
NAPL-C-139	Chloromethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Bromomethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Vinyl chloride	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Chloroethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Methylene chloride	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Carbon disulfide	J	S	Surrogate recovery low	680-44932
NAPL-C-139	1,1-Dichloroethene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	1,1-Dichloroethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	cis-1,2-Dichloroethene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	trans-1,2-Dichloroethene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Chloroform	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	1,2-Dichloroethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	1,1,1-Trichloroethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Carbon tetrachloride	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Bromodichloromethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	1,1,2,2-Tetrachloroethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	1,2-Dichloropropane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	trans-1,3-Dichloropropene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Trichloroethene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Dibromochloromethane	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	cis-1,3-Dichloropropene	บյ	S	Surrogate recovery low	680-44932
NAPL-C-139	Bromoform	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	2-Hexanone	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	4-Methyl-2-pentanone	ÜJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Tetrachloroethene	UJ	S	Surrogate recovery low	680-44932
NAPL-C-139	Chlorobenzene	J	S	Surrogate recovery low	680-44932
NAPL-C-139	Styrene	UJ	S	Surrogate recovery low	680-44932

J Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Saharie Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	45,715,524	х	
8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate		,	
	per twenty for each matrix?			X
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?			X
	Using informed professional judgment, the data reviewer should use the MS and MSD results in			
	conjunction with other QC criteria and determine the need for qualification of the data for samples from			
	the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+			

Note: Samples were not spiked for VOCs analysis.

#### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA
9.1	Is an LCS recovery form present?	X		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X		
9.4	If Level IV, verify the % recoveries are calculated correctly.	x		
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			

Note: LCS samples were within evaluation criteria, and % recoveries were recalculated and no errors in calculation were noted.

#### 10.0 Internal Standards (Code I)

					Yes	No	NA
10.1	Are internal stan	dard areas for every sample	and blank within upper and	Hower QC limits?	5120275	Х	
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R	1		
Note:	The method spec	ification is for the continuin	g calibration to be compare	d to the mid-point initial			
	calibration, not s	ample to continuing calibrat	ion. Thus, if all other QC s	pecifications are met for a given			
	sample, using in	formed professional judgmen	nt, the reviewer may choose	e not to flag individual samples i	n		
10.2		nes of internal standards with			( <b>x</b>		
	Action: The chr	omatogram must be examine	ed to determine if any false	positives or negatives exist. Fo	r		
	shift of a large m	agnitude, the reviewer may	consider partial or total reje	ction of the data for non-detects	ľ		
***	in that sample/fr	action.					

The internal standard chlorobenzene-d5 had an area that was below the lower limit for sample NAPL-C-139, the sample was reanalyzed and the area was also below the lower limit. Sample was previously qualified due to surrogate recoveries, no

Note: qualifications of data were required

#### 11.0 TCL Identification (Code W)

		Yes	No	NA_
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard			
	RRT in the continuing calibration?	<b>* X</b>		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample			
	mass spectrum; and do sample and standard relative ion intensities agree within 30%?	. <b> X</b>		

Note:

## 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	A LX		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	* X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations	x		

For the validation of compound quantitation, ten percent of the detected results were recalculated from the raw data, and no

Note: calculation errors were noted.

#### 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA_
13.1	Were any field duplicates submitted for VOC analysis?	<b>等等的数</b>	x	
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?			х
	Action: No qualifying action is taken based on field duplicate results, however the data validator should			
l	provide a qualitative assessment in the data validation report.			
	\			

Note: No field duplicates were submitted for VOC analysis.

#### 14.0 Data Completeness

			Yes	No	NA.
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or us	se 95% for aqueous	X		
14.2	Number of samples:	12			
14.3	Number of target compounds in each analysis:	34			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$				Ì
<u> </u>	% Completeness	100			

Note:

# DATA VALIDATION WG. SHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer: Tony Sedlacek	Project Name:	SA2 Sup. Investigation
Date: 7/5/2006	Project Number:	21561683.80011
Laboratory Severn Trent Laboratory - Savannah	SDG No.:	SAS044
	Review Level:	Level IV

#### Major Anomolies:

4,6-Dinitro-2-methylphenol, and Dinoseb in sample NAPL-A-40 were rejected due to %D >50% between ICAL and CCAL RRFs.

2,4-Dinitrophenol, and Pentachlorophenol were rejected due to MS/MSD results of zero.

#### Minor Anomolies:

Samples were qualified due to method blank contamination, ICAL R ^ 2 <0.990, %D>20% between ICAL and CCAL RRFs, and internal standard > 100%.

Field IDs: So

Soil-Q-21-SS-0.5' Soil-Q-21-SB-4' TB-2 NAPL-B-34' NAPL-A-138 TB-4

TB-1

NAPL-B-139

NAPL-C-31 NAPL-C-139 TB-3 NAPL-A-40

#### 1.0 Chain of Custody/Sample Condition

_	_		Yes	No	NA
	1.1	Do Chain-of-Custody forms list all samples analyzed?	* X		
F	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
		condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated Bis (2-ethylhexyl) phthalate was detected above the MDL, but below the RL in method blanks 680-45218 and 680-16419-7. Surrogates were diluted out of samples: Soil-Q-21-SS-0.5, and Soil-Q-SS-0.5 MS/MSD. MS/MSD recoveries were low in sample Soil-Q-21-SS-0.5. Internal standards were outside control limits in samples NAPL-C-31, NAPL-B-139, and NAPL-A-138. These samples were reanalyzed to confirm internal standards were outside control limits.

#### 2.0 Holding Time/ Preservation (Code H)

 		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached		of the X and the	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2,3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		Table X	
 Note:	All holding times were met.			

#### 3.0 GC/M trument Performance Check (Code T)

		Yes	No	NA NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	. X 2		
3.2	Have all samples been analyzed within twelve hours of the tune?	A X SEE		
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	/ x ( ) ( )		
	If no, all standards, blanks, field samples and QC samples are rejected "R".			

Note: All tuning criteria was met.

4.0 Blanks (Method Blanks and Field Blanks) (Code X - Field Blank Contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	<b>X</b>		
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?	X	<b>在2008年</b>	
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?		el territorio	Х
	Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be qualified "U" and the detection limit elevated to the RL for estimate concentrations.			
4.4	If Level IV, review raw data and verify all detections for blanks were reported.	X		

Note:

Bis(2-ethylhexyl)phthalate was detected in method blank 680-45218 in batch 680-45377. Sample NAPL-A-40 was associated with this analysis batch and Bis(2-ethylhexyl)phthalate was detected and qualified non-detected "U". Also, no field blanks were part of this SDG. Raw data was reviewed and Bis(2-ethylhexyl)phthalate was verified as a detection in the method blank.

Field ID	Analyte(s)	Qualification	Code	Justification	Run #
NAPL-A-40	Bis(2-ethylhexyl)phthalate	Ü	Z	Method blank contamination	680-45377

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	7 - 7 - 42 - 52	х	
	If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01 for		11/2/14	<del></del>
	poor responders like amines and phenols)? If yes, J(+)/R(-).		X	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	XE YE		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	X		
			<del></del>	

Note:

Initial calibration for instrument MSN5973 had compound 2,4-Dinitrotoluene (.988) with R^2 < 0.990. The initial calibration for instrument MST5973 had compound Pentachlorophenol (.986) with R^2 < 0.990. Compound Dinoseb(38%) had %RSD > 15%. All samples were nondetect for 2,4-Dinitrotoluene and were qualified estimated non-detected "UJ". Pentachlorophenol was previously qualified due to MS/MSD recoveries, and Dinoseb was previously qualified due to continuing calibration. Recalculations of the RRFs and %RSD were performed, and no errors in calculation were noted.

Field ID	Analyte(s)	Qualification	Code	Justification	Run#
Soil-Q-21-SB-4	2,4-Dinitrotoluene	ÜĴ	С	ICAL R ^ 2 < 0.990	680-45106
Soil-Q-21-SS-0.	2,4-Dinitrotoluene	UĴ	С	ICAL R ^ 2 < 0.990	680-45106
NAPL-C-31	2,4-Dinitrotoluene	UJ	С	ICAL R ^ 2 < 0.990	680-45106
NAPL-C-139	2,4-Dinitrotoluene	UJ	C	ICAL R ^ 2 < 0.990	680-45106
NAPL-B-34	2,4-Dinitrotoluene	UJ	С	ICAL R ^ 2 < 0.990	680-45106
NAPL-B-139	2,4-Dinitrotoluene	UJ	С	ICAL R ^ 2 < 0.990	680-45106
NAPL-A-40	2,4-Dinitrotoluene	UJ	C	ICAL R ^ 2 < 0.990	680-45377
NAPL-A-138	2,4-Dinitrotoluene	Ü	С	ICAL R ^ 2 < 0.990	680-45106

#### 6.0 Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	**************************************		
6:2	Has a continuing calibration standard been analyzed every 12 hours?	<b>在1984年</b>	х	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	\$12000X		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	X		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/UJ(-). For %D	]		
	> 50%, flag R.			-
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		1 x 2 x x x x x x x x x x x x x x x x x	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.	Х		

Note:

The following compounds have %D < 20% between the ICAL and CCAL RRFs for samples associated continuing calibration dates 5/18/06: 2,6-Dinitrotoluene(30.1%), 4,6-Dinitro-2-methylphenol(21.5%), Pentachlorophenol(-20.5%). Compounds from CC date 5/23/06: 2,6-Dinitrotoluene(29.7%), 2,4-Dinitrophenol(41.3%), 4,6-Dinitro-2-methylphenol(52.4%), Benzo (k) fluoranthene(22.4%), and Dinoseb(74.7%). These compounds were all non-detect in all associated samples and were qualified estimated non-detect "UJ", and compounds with a %D > 50% were qualified Rejected "R". Pentachlorophenol and 2,4-Dinitrophenol were previously qualified due to MS/MSD recoveries. Recalculation of the RF and %D for one compound per standard was completed, and no errors in the calculations were noted.

Field ID	Analyte(s)	Qualification	Code	Justification	Run#
Soil-Q-21-SB-4	2,6-Dinitrotoluene	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
Soil-Q-21-SS-0.5	2,6-Dinitrotoluene	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-C-31	2,6-Dinitrotoluene	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-C-139	2,6-Dinitrotoluene	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-B-34	2,6-Dinitrotoluene	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-B-139	2,6-Dinitrotoluene	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-A-40	2,6-Dinitrotoluene	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-A-138	2,6-Dinitrotoluene	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
Soil-Q-21-SB-4	4,6-Dinitro-2-methylphenol	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
Soil-Q-21-SS-0.5	4,6-Dinitro-2-methylphenol	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-C-31	4,6-Dinitro-2-methylphenol	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-C-139	4,6-Dinitro-2-methylphenol	ÜJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-B-34	4,6-Dinitro-2-methylphenol	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-B-139	4,6-Dinitro-2-methylphenol	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-A-138	4,6-Dinitro-2-methylphenol	UJ	C	%D >20% between ICAL and CCAL RRFs	680-45106
NAPL-A-40	4,6-Dinitro-2-methylphenol	R	C	%D >50% between ICAL and CCAL RRFs	680-45377
NAPL-A-40	Benzo[k]fluoranthene	UJ	С	%D >20% between ICAL and CCAL RRFs	680-45377
NAPL-A-40	Dinoseb	R	C	%D >50% between ICAL and CCAL RRFs	680-45377

#### 7.0 Surrogate Recovery (Code S)

				Yes	No	NA
7.1	Are all samples listed on the appropriate Surro	gate Recovery Summary		E X		
7.2	Are surrogate recoveries within acceptance cri	eria specified in the QA	PP for all samples and method blanks?	SAME OF RE	х	
7.3	Are more than one of either fraction outside the acceptance criteria?					
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?				х	
7.5	If Yes in Section 7.3, is any sample dilution fa	ctor greater than 10?				X
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no					
	reanalysis is required and acids and base/ neut	als are assessed separate		<u> </u>		
	> UCL 10%	o LCL	< 10%			
	Positive J.	J	J			
	Non-detect None I	IJ	R			

Note:

The surrogates in samples Soil-Q-21-SS-0.5 and Soil-Q-21-SS-0.5 MS/MSD were not recovered due to a dilution. All other surrogates were within evaluation criteria for all other samples. Therefore, no qualifications of data were required.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA J
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X X		
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	- X S		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?		x	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction	1		
<b>\</b>	with other QC criteria and determine the need for qualification of the data for samples from the same			
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: The spike recoveries were zero for compounds 2,4-Dinitrophenol, and Pentachlorophenol in sample Soil-Q-21-SS-0.5, and were qualified rejected "R".

Field ID	Analyte(s)	Qualification	Code	Justification	Run #
Soil-Q-21-SS-0.	2,4-Dinitrophenol	R	M	MS/MSD recovery of zero	680-45106
Soil-Q-21-SS-0.	Pentachlorophenol	R	М	MS/MSD recovery of zero	680-45106

# 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA NA
9.1	Is an LCS recovery form present?	X. ( )		
9.2	Is LCS analyzed at the required frequency for each matrix?	X		
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?	<b>X</b> (1)		
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; <lcl, <30%<="" j(+)="" td="" uj(-);=""><td></td><td></td><td></td></lcl,>			
	J(+)/R(-). RPD failures should be flagged "J" (+ only)			
9.4	If Level IV, verify the % recoveries are calculated correctly.	Х		

Note:

All LCS were within evaluation criteria. Ten percent of the spiking compound recoveries for the LCS were recalculated using the LCS summary form, and no calculation or transcription errors were noted.

#### 10.0 Inter. tandards (Code I)

					Yes	No	NA NA
10.1	Are internal stan	ndard area of every sample a	nd blank within upper and lo	ower QC limits for each continui	ng 🤼 💢	X	
		Area $> +100\%$	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
Note:	The method spe-	cification is for the continui	ng calibration to be compare	ed to the mid-point initial calibrate	tion,		
	not sample to continuing calibration. Thus, if all other QC specifications are met for a given sample, using				ng		
	informed professional judgment, the reviewer may choose not to flag individual samples in this case.						
10.2	Are retention tin	nes of internal standards wit	hin 30 seconds of the associ	ated calibration standard?	X		
	Action: The chr	romatogram must be examin	ed to determine if any false	positives or negatives exist. For	shift		
	of a large magnitude, the reviewer may consider partial or total rejection of the data for non-detects in that				at		
	sample/fraction.		•				

Note:

The internal standard area were outside of the QC limits in samples NAPL-C-31, NAPL-B-139, and NAPL-A-138. All detected analytes were qualified as estimated "J". The compound 4-chloroaniline result was already estimated, because the result was between the MDL and RL, no qualification of data was required. These samples were reanalyzed to confirm that the internal standards were outside of control limits and the reanalysis confirmed the internal standards were outside evaluation criteria. The results from the original analysis for samples NAPL-C-31, NAPL-B-139 and NAPL-A-138 were used for this validation.

#### 11.0 TCL Identification (Code W)

_			JC	Yes	No	NA NA
Γ	11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in				
		the continuing calibration?		χ.		
I	11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass	*	w.		
L		spectrum; and do sample and standard relative ion intensities agree within 30%?		X		

Note:

#### 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

 		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	X X		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	246 <b>x</b> 440		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations	x		

Note:

For the validation of compound quantitation, approximately ten percent of the detected compound results were recalculated from the raw data, and no calculation errors were noted.

#### 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	<b>9</b> 73868475	х	
13.2	Were all RPD or absolute difference values within the control limits?	55.86.86.87		X
	No action is taken based on field duplicate results, however the data validator should provide a qualitative		•	
	assessment in the data validation report.			

Note: Field duplicate were not submitted for SVOC analysis.

# 14.0 Data Completeness

				Yes	No	NA
1	4.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample,	X		
1	4.2	Number of samples:	12			
1	4.3	Number of target compounds in each analysis:	65			
1	4.4	Number of results rejected and not reported:	4			
		% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
		% Completeness	99.48717949			

# DATA VALIDATION W. .. KSHEET HERBICIDES ANALYSIS

Reviewer: Tony Sedlacek	Project Name:	Sauget - Area 2
Date: 7/5/2006	Project Number:	21561683.80011
Laboratory Severn Trent Laboratory - Savannah	SDG No.:	SAS044
	Review Level:	Level III
Major Anomolies:		
None		

#### Minor Anomolies:

MCPA was qualified in samples Soil-Q-SS-0.5, and Soil-Q-SB-4' for continuing calibration outside evaluation criteria.

Field IDs:

Soil-Q-21-SS-0.5 Soil-Q-21-SB-4

#### 1.0 Chain of Custody/Sample Condition

			Yes	No	NA
	1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
$\Gamma$	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
L		of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated the grand mean was exception was applied to continuing calibration verification standards. The LCS/LCSD recovery for 2,4-DB was outside evaluation criteria.

#### 2.0 Holding Time/ Preservation (Code h)

		Yes	INO	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached			
	Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		X 3	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		XXX	
<b>.</b>			<del></del>	

Note: All holding times were met.

#### 3.0 Less (Method Blanks and Field Blanks) (Code x - Field Blank Contamination)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?	YEAR X COM		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?		<b>第45</b> 次分析	х
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: Field/rinse/equipment blanks were not part of this SDG.

#### 4.0 Initial Calibration (Code r)

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	3 X		
4.2	Are calibration factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument		Х	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: The compound MCPA has an R^2 value of 0.990 which is <0.995. All associated samples will be qualified estimated "J" for detects and estimated non-detected "UJ" for all non-detects.

Field ID	Analyte(s)	Qualification	Code	Justification	Run #
Soil-Q-21-SS-0	MCPA	UJ	г	ICAL R^2 <0.995	680-44820
Soil-Q-21-SB-	MCPA	UJ	r	ICAL R^2 <0.995	680-44766

#### 5.0 Continuing Calibration (Code c)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	nor x no		<del></del>
5.2	Has a continuing calibration standard been analyzed every 12 hours?		х	
5.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 20%)?	х		
5.5	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.  If Level IV, calculate a sample of CFs and %Ds from ave CF to verify correct calculations.			Y

Note:

The grand mean exception was applied to continuing calibration verification standards. This rule is described in Method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference (%D) of all the compounds in the CCV is less than or equal to 15 %.

#### 6.0 S. gate Recovery (Code s)

		Yes	No	NA_
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?	X		
6.2	Are surrogate recoveries within acceptance criteria specified in the QAPP for all samples?	<b>X X</b>		
6.3	If No in Section 6.2, were these sample(s) or method blank(s) reanalyzed?			х
6.4	If No in Section 6.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted out.)			X
	> UCL 10% to LCL · <10%			
	Positive J J J			
	Non-detect None UJ R			

Note: All surrogate recoveries were within evaluation criteria.

7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)\_

		·	Yes	No	NA
	7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
	7.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty	X		
Γ	7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	X X		
$\Gamma$		Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
1		other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			
		Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			
		Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)		·····	Ļ

Note: Sample Soil-Q-21-SB-4' was spiked and analyzed for herbicides and all MS/MSD recoveries were within evaluation criteria.

#### 8.0 Laboratory Control Sample (LCS/LCSD) (Code l - LCS recovery Code e - RPD)

	· · · · · · · · · · · · · · · · · · ·	Yes	No	NA
8.1	Is an LCS recovery form present?	3 X		
8.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	26. X		
8.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	884.55	х	
8.4	If Level IV, verify the % recoveries are calculated correctly.			Х
	Action for specific compound outside the acceptance criteria: %R>UCL,		·	
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<30%$ $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			

Note:

LCS/LCSD recovery is above evaluation criteria for 2,4-DB, all compounds were non-detected in associated samples. Therefore, no qualifications of data were required.

# 9.0 TCL Identification (Code w)

		Yes	No	NA
9.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the			
	continuing calibration?	X		

10.0 1	Quantitation and Reported Detection limits (Code p)	Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?			
10.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
10.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
10.4	If Level IV, calculate a sample of positive results to verify correct calculations			X

11.0 Field Du	plicate Samples (Code f)	Yes	No	NA
11.1	Were any field duplicates submitted for herbicide analysis?	Received the Control	Х	
11.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?			х
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
L '	qualitative assessment in the data validation report.			

Note: There were no field duplicates submitted for herbicide analysis.

# 12.0 Data Completeness

	<u> </u>		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit: Check QAF	PP or use 95% for aqueous sample, 90%	X X		
12.2	Number of samples:	2			<u> </u>
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	100			

# DATA VALIDATION WORKS' Inorganic - ICP, ICP-MS,

T - Level III Review A, and CVAA

Reviewer: Date: Laboratory	Tony Sedlacek 7/6/2006 Severn Trent Laboratory - Savannah			Pr Proje	ect N	lumb		21					
Major Anomol				R			_	Lev					
Minor Anomol	ies: Sodium was qualified non-detect "U" in sample Soil-Q-21-SB-4' due to blank contamination.									AA CVAA- lo NA Yes No  x  x  x  e evaluation crite  AA CVAA- lo NA Yes No			
Field IDs:	Soil-Q-21-SS-0.5 Soil-Q-21-SB-4'												
1.0 Chain of C	ustody/Sample Condition/Raw Data	Yes	ICP No	NA)		CP-M No			FAA No				
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	X			£1184					/****			
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	<b>X</b>		, i	2.5	i i		4		35	X-		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x									x 3		
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: $4^{\circ}C + 2^{\circ}C$ )	X		3100000				j.		を表する。	X		
	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	X		1						37			
Note:	The laboratory case narrative indicated copper, potassium, and sodium was detected in the method blank for mercury in sample Soil-Q-21-4'.	. M	atrix	spike	reco	very	was	outsi	de ev	valuati	on cr	iteria	1
2.0 Holding Ti	me (Code h)		ICP	T	I	CP-N	1S T		FA.	Ā T	CVA	A-H	g
		Yes											
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) See attached Holding Time Table.		X								7	X	
	Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria)										30		

Note:

All samples met holding time criteria.

3.0 Instrum	Calibration (Code c)	Î	ICP	I	CP-MS	GFA.	A CVAA-	Į,
		Yes	No	VA Yes	No NA	Yes No	NA Yes No	
3.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard)	1		44.57		202		
	GFAA: blank + three standards; CVAA: blank + five standards)	X		100			X	
3.2	Are the correlation coefficients $> 0.995$ ? (for GFAA and CVAA) Action: $J(+)/UJ(-)$ .						1884	Х
3.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If	7		100 A				
	no, use professional judgment to determine affect on the data and note in reviewer narrative.	X		240			x	ĺ
3.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours							
}	whichever is more frequent? Action: If no, use professional judgment to determine affect on the data			78.9				}
	and note in reviewer narrative.	X					X	
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury					#23%	25.5	
1	(80%-120%) and other Metals (90%-110%).							
	Action: $R(+/-)$ $J(+)/UJ(-)$ $J(+)$ $R(+)$	X		8/4/2		5.90	X	
	Mercury < 65% 65% - 79% 121% - 135% > 135%			168		4. W		
	Other Metals < 75% 75% - 89% 111% - 125% > 125%			3380		<b>3000</b>	类数	

Note: The calibration standards are listed in %RSD not correlation coefficients for CVAA, and all were within evaluation criteria.

#### 4.0 Blanks (Code o - Calibration blank failure, Code p - Preparation blank failure, Code x - Field blank failure)

			ICP		CP-MS		FAA		A-Hg
		Yes	No	NA Yes	Nol	√A Yes	No N	A Yes N	NO NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X						X	
4.2	Are there reported PB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x							x
4.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	X		10.00				X	-
4.4	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data to note in reviewer narrative.	X						x	
4.5	Are there reported ICB or CCB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x		,					X.
4.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.		x					28 - SO	X
4.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, $J(+)/UJ(-)$ .		X					<b>X</b> 9.33	x

Note:

Copper, potassium, and sodium were detected in the method blank, copper and potassium were both detected in the samples at levels higher than 5X the blank contamination, no qualification of data was required. Sodium was detected in sample Soil-Q-21-SS-0.5 at levels higher that 5X the blank contamination, therefore no qualification of data was required. Sodium was also detected in sample Soil-Q-21-SB-4' at levels less than the blank contamination and was qualified as non-detect "U". The ICB and CCB had reported values above the IDL for Beryllium, calcium, chromium, copper, vanadium, and zinc. The ICB and CCB values had no affect on sample results, due to sample results were greater than 5X the ICB, and CCB values, no qualifications of data were required.

Field ID	Analyte(s)	Qualification	Code	Justification
Soil-Q-21-SB-4	Sodium	Ŭ	р	Method Blank contamination

5.0 ICP Inte	rference Check Sample (ICS) (Code n)		ICF		ICP-MS		GFAA		VAA-Hg
		Yes	No	NA Yes	Nol	VA Ye	s No l	VA Ye	No NA
5.1	Was ICS AB analyzed at beginning of each ICP run (or at least twice every 8 hours), and at th	e			š				T
<b> </b>	Was ICS AB analyzed at beginning of each ICP run (or at least twice every 8 hours), and at th beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	X						ļ	
5.2	Are the ICS AB recoveries within 80% - 120%?	X.		3/12	7				
5.3	Are the results for unspiked analytes (in ICS A) < + IDL?		х				T		
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	1800	X	2.5					
	Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)	经验		10.81	4				
	<-IDL > IDL <50% 50% - 79% > 120%	F 1972			Ř.				
	UJ(-) $J(+)$ $R(+/-)$ $J(+)/UJ(-)$ $J(+)$	Water P			¥				

Copper, lead, and zinc had ICS A values greater than the IDL, and aluminum, calcium, iron, and magnesium sample results were much greater than the spiked sample in the ICS. Due to high levels of target analytes in the samples, no qualifications of data were required.

aborat	ory Control S	Sample (LCS)	(Code I - Reco	very, Code e -	RPD)				ICP		CP-MS		FAA		AA-H
				•				Yes	No	NA Yes	NoN	A Yes	NoIN	A Yes	No .
6.1					ency (one per 20 stated with LCS re		ch, per matrix	X.						x	
6.2		recovery out as per EPA-I		limits? (Aque	eous limits: 80%	- 120% - excep	t Ag and Sb;		X						x
	Action:	So	olid		Aqueous									5	
		< LCL	> UCL	< 50%	50% - 79%	> 120%									
		J(+)/ÜJ(-)	J(+)	R(+/-)	J(+)/UJ(-)	J(+)			×1.4		3.00		235		<b>福設</b>

Note: All LCS were within evaluation criteria.

aborat	tory Duplicates (Code k)	<u></u>	ICP	I	CP-MS	S GF	AA	CVA	√-Hg
		Yes	No	NA Yes	No N	VA Yes N	Io NA	Yes No	οN
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.		x					X	
7.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		X			4		i x	West to a
7.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQL for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+).			x				, X	
	Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	<b>学位张</b>		Carre		2000		2.35	П

Note:

A laboratory duplicate was not prepared and analyzed on ICP analysis. Professional judgment was used to not qualify data based on all other QC data was within evaluation criteria for ICP analysis.

8.0 Spike S	le Analysis -Pre-Digestion (Code m - Recovery, Code d - RPD)		ICP			P-MS	GF		CVAA	-
-	,	Yes	No	NAI	es [	No NA	Yes N	lo NA	Yes No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.								X	
8.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		X		4/000 00000 CV				X	100 m
	Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.				COLUMN TAR					SAMPRIA.
8.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75-125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)			1					) 2 x	
	%R > 125% 30% < %R < 74% %R < 30%	40		Ş	100		2.30		F	
	Positive J J	外海			<b>然</b>		N C			
	Non-detect None UJ R						(p-7 = 1		14.00	.1

Samples were not spiked and analyzed for ICP analysis, but sample Soil-Q-21-SB-4' was spiked and analyzed for mercury. MS recovery for mercury was 131%, the MSD result was 90% within the control limit of 80-120%. Thus, since the MSD was within control limits and the RPD was within QC limits no qualification

9.0 Instrument Detection Limits (IDL)		ICP	10	CP-MS		JFA <i>A</i>	\ \ \	CV	A-F	łg
	Yes	No N	Yes	No NA	Yes	No	NA Y	Yes [	No	NA
9.1 Are all IDL equal to or less than the reporting limits specified?	7.X		(Set 27)		1 ( 1 ( ) ( ) ( ) ( ) ( )		0	X	$\Box$	
Note:										

10.0	ICP	Serial	Dilutions	(Code s)

1	0.0 ICP Seri	al Dilutions (Code s)		ICP		CP-MS		3FAA		AA-	
			Yes	No	NA Yes	No NA	Yes	No NA	Yes	No	NA
	10.1	Were serial dilutions performed?	X		3 (3) (3) (3) (4) (2)						
	10.2	Was a five-fold dilution performed?	X								
	10.3	Did the serial dilution results agree within 10% for analyte concentration $> 50$ x the IDL in the original sample? If no, $J(+)$ .	X								

Note:

	i i.v riela Duj	plicate Samples (Code 1)	1	ICP			P-MS		JFAA	_	AA-	9-11
_			Yes	No	NA	Yes	No N	A Yes	No NA	Yes	No	NA
		Were any field duplicates submitted for metal analysis?	200°	Х				350		7967	X	
	11.0	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% or difference <										
L	11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% or difference < $\pm$ 2 x PQL and For solids, RPD < 50% or difference < $\pm$ 4 x PQL)			x .							x

Note: No field duplicates were submitted for metals analysis.

12.0 Result	ification (Code Q)		ICP	ICP-MS	GFAA	CVAA-I'
		Yes	No NA	Yes No N	A Yes No NA	Yes No
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	X		类的是	13.20 L	X
12.2	Were all dilution reflected in the positive results and detection limits?	× X			1.76 T	Ş≯X⊊

# 13.0 Data Completeness

13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous					T
	sample, 90% for soil sample)					1 [
13.2	Number of samples:	2	]   0		)	2
-13.3	Number of target compounds in each analysis:	22	]   0	(	)	1 1
13.4	Number of results rejected and not reported:	0	]   0	(	)	0
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$		]		1	i i
	% Completeness	100	###	# #1	##	100

#### DATA VALIDATION WO. JHEET WET CHEMISTRY ANALYSIS

Reviewer: Tony Sedlacek 7/6/2006 Date: Laboratory Severn Trent Laboratory - Savannah Test Name: Ammonia, TOC Method No.: 350.1, 9060

Project Name: Sauget - Area 2 Project Number: 21561683.80011 SDG No.: SAS044 Review Level: Level IV

#### Major Anomolies:

No samples were rejected

#### Minor Anomolies:

Sample Soil-Q-21-SS-0.5 was qualified due to MS/MSD recovery for ammonia.

Field IDs: Soil-Q-21-SS-0.5

NAPL-B-34 Soil-Q-21-SB-4' NAPL-B-139 NAPL-C-31 NAPL-A-40 NAPL-A-138

NAPL-C-139

#### 1.0 Chain of Custody/Sample Condition

	``	Yes	No	NA_
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
	of samples, analytical problems or special circumstances affecting the quality of the data?	x		

MS/MSD recovery for ammonia was outside evaluation criteria for sample Soil-Q-21-SS-0.5. Note:

# 2.0 Holding Time/ Preservation (Code h)

		Y es_	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	3X.		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached			
· II	Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	_L	X	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		X.	
Note:	All holding times were met.			

3.0 Bla. (Method Blanks and Field Blanks) (Code x - Field Blank Contaminatio. ode z - Method blank contamination)

	· · · · · · · · · · · · · · · · · · ·	Yes	No	-NA
3.1	Is a Method Blank Summary form present for each batch?	X X		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?		# 2 W S	X
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.	X		

Note: No field/rinse/equipment blank were submitted for analysis. Raw data was reviewed and verified that no detections were found in the blanks.

#### 4.0 Initial Calibration (Code c)

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	** X		
4.2	Are correlation coefficients stable (>0.995) over the concentration range of the instrument?	televis 3		X
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.	X		

Initial calibration was not expressed in correlation coefficients, it was expressed in %R and all were within evaluation criteria. Approximately 50 percent of the initial calibration and ICV recoveries were recalculated and compared to the raw data; no calculation or transcription errors

#### 5.0 Continuing Calibration (Code r)

Note:

Note:

Note:

 		Yes	No	NA J
5.1	Are Continuing Calibration Summary forms present and complete?	<b>X</b> 3		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	X		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X	
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %R < 50%, flag R.			
5,4	If Level IV, calculate a sample of %Rs.	Х		

Continuing calibration criteria was within evaluation criteria. Approximately 10 percent of the CV sample recoveries were recalculated and compared to the raw data. No calculation or transcription errors were noted.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA
6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	i X		
6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	2000	Х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
	other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			
	Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			]

The MS/MSD recoveries for ammonia (71/72%) were outside evaluation criteria ((75-125%) in sample Soil-Q-21-SS-0.5. Ammonia was qualified estimated "J" in sample Soil-Q-21-SS-0.5.

					<del></del> 7
Field	Analyte(s)	Qualification	Code	Justification	Rui
Soil-Q-21-SS-0	Ammonia	J	m	Low MS/MSD recovery	680-45836

#### 7.0 Laboratory Control Sample (LCS/LCSD) (Code l - LCS recovery Code e - RPD)

		Yes No	NA
7.1	Is an LCS recovery form present?	X	
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	i.e.ax	
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X	
7.4	If Level IV, verify the % recoveries are calculated correctly.	X	
	Action for specific compound outside the acceptance criteria: %R>UCL,		
}	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<30%$ $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)		

Note: All LCS recoveries within evaluation criteria, and % recoveries were recalculated and no errors were found in calculations.

#### 8.0 Analyte Identification

		Yes	No	NA
8.1	Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the			
1	standard RRT in the continuing calibration?			x

Note:

#### 9.0 Analyte Quantitation and Reported Detection limits

<u>.</u>		Yes	No J	NA ]
9.1	Are RLs used consistent with those specified in the QAPP?	X		
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X ., 4	
9.4	If Level IV, calculate a sample of positive results to verify correct calculations	X		

For the validation of compound quantitation, ten percent of the detected results were recalculated from the raw data, and no calculation errors

Note: were noted.

# 10.0 Field Duplicate Samples (Code f)

		Yes	No	NA
10.1	Were any field duplicates submitted?	2200420	Х	
10.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	Mark Control		Х
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provi	de a		
	qualitative assessment in the data validation report.			
Note:	Field duplicate samples were not submitted for analysis			

# 11.0 Laboratory Duplicates (Code k)

		Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with duplicate results.	2 5 4 2 7 3 X		
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		7 1	
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQL for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	F : 27% 200 25 35 558		

Note: No laboratory duplicates were performed for TOC or ammonia analysis.

# 12.0 Data Completeness

				Yes	No	NA
	12.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample, 90%	X ·		
	12.2	Number of samples:	8			
	12.3	Number of target compounds in each analysis:	_1			
[	12.4	Number of results rejected and not reported:	0			
}		% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
		% Completeness	100			

SDG No: SAS045



#### DATA VALIDATIC. WORKSHEET **VOLATILE ORGANIC ANALYSIS**

Tony Sedlacek **Project Name:** Reviewer: Sauget - Area 2 Date: 7/21/2006 **Project Number:** 21561683.80011 SDG No.: Laboratory Severn Trent Laboratory - Savannah **SAS045** Review Level: Level III

#### Major Anomolies:

No samples were rejected

#### Minor Anomolies:

Analytes required qualification due to continuing calibration %D > 20% and high surrogate recovery.

Field IDs:

NAPL-A-(75-80) NAPL-B-(80-85) NAPL-C-(20-25) NAPL-A-(95-100) NAPL-B-(110-115) NAPL-C-(65-70) NAPL-A-(105-110) NAPL-C-(100-105) NAPL-B-138 TB-4

NAPL-B-(20-25) NAPL-C-31-D

#### 1.0 Chain of Custody/Sample Condition

 		Yes	No _	NA.
1.1	Do Chain-of-Custody forms list all samples analyzed?	<b>*</b> *** <b>X</b> ******************************		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated acetone was detected in method blank 680-45894. All surrogates were outside of evaluation criteria in sample NAPL-C-31-D. LCS recovery was outside evaluation criteria for acetone in LCS sample 680-45893/3 and LCSD sample 680-45893/4. An LCSD was not analyzed for with analysis batch 680-45876, which only contained a method blank and trip blank analysis.

#### 2.0 Holding Time/ Preservation (Code H)

					Y	es	NO	NA
2.1	Do sample preservat	ion, collection and stor	age condition meet me	thod requirement?	\$ \cdot \( \)	186. 21 2844		
	unpreserved or temp	erature is outside the ra	ange 0° (but not frozen	<2° >6°C, etc.), comment in rep ) to 10° flag all positive results itive detections "J" and non-dete	with a	-	,	
2.2	Have any technical h J(+)/UJ(-).	olding times, determin	ed from sampling to d	ate of analysis, been exceeded?	If yes,	Die my	X.J.	
	Matrix	Preserved	Aromatic	All others				
	Aqueous	No	7 days	14 days				
		Yes	14 days	14 days				
	Soil/Sediment	$4  {}^{\circ}\text{C} \pm 2  {}^{\circ}\text{C}$	14 days	14 days				
2.3	Have any technical	nolding times been gro	ssly (twice the holding	time) exceeded? If yes, J(+)/R	(-).	7	X	
Matai	A 11 (	·						

Note: All holding times were met.

#### 3.0 GC/MS Instrument Performance Check (Code T)

 		Yes	No	NA J
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	X		
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	X		
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	<b>X</b> • <b>X</b>		

Note: All BFB criteria has been met.

#### 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	X		
4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?	х	2000年	
4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?		X	
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated			
<del></del>	to the RL for estimate (laboratory "J" flagged) concentrations.	<del> </del>	<del> </del>	
4.4	If Level IV, review raw data and verify all detections for blanks were reported.	<u> </u>		X

Note: Acetone was detected in method blank 680-45894. Sample NAPL-C-31-D was associated with this method blank and was nondetect for acetone. No qualification of data was required.

#### 5.0 GC/MS Initial Calibration (Code C)

	Yes	No	NA
Are Initial Calibration summary forms present and complete for each instrument used?	X		
Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	X		
If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01		15-20-7-7	
for poor responders like ketones or alcohols)? If yes, $J(+)/R(-)$ .		X	
Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X		
If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			Х
	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?  If not, $J(+)/UJ(-)$ . In extreme cases, the reviewer may flag non-detects "R".  Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01 for poor responders like ketones or alcohols)? If yes, $J(+)/R(-)$ .	Are Initial Calibration summary forms present and complete for each instrument used?  Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?  If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".  Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01 for poor responders like ketones or alcohols)? If yes, J(+)/R(-).  Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	Are Initial Calibration summary forms present and complete for each instrument used?  Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?  If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".  Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01 for poor responders like ketones or alcohols)? If yes, J(+)/R(-).  Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.

Note: All initial calibration criteria was met.

# 6.0 Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	<b>X</b> :		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	2. E. 1977	х	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	SCAN .		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial			
	and continuing calibration RRF outside QC limits (%D < 20%)?	x		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For			
ļ	%D > 50%, flag R.			ļ
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		1. X., 0	
6.6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			X

A continuing calibration standard was not analyzed every 12 hours, although all samples were analyzed within 12 hours of the standard being analyzed. Compounds acetone (30.3%), carbon disulfide (29.1%), 2-butanone 22.1%), chloroethane (23.0%) and methylene chloride (22.5%) had %D > 20% between initial and continuing calibration outside QC limits. All detected compounds

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
NAPL-B-138	Acetone	J	С	680-4	CCAL %D > 20
NAPL-B-138	Carbon Disulfide	J	С	680-4	CCAL %D > 20

# 7.0 Surrogate Recovery (Code S)

				Yes	No	NA
7.1	Are all samples listed on the ap	propriate Surrogate Recovery S	ummary Form ?	X X	4	
7.2	Are surrogate recoveries within	acceptance criteria specified in	the QAPP for all samples	?	X	
7.3	If No in Section 7.2, were these	sample(s) or method blank(s) re	eanalyzed?		X	
7.4	If No in Section 7.3, is any sam out.)	ole dilution factor greater than	10? (Surrogate recoveries	may be diluted		
· ·· - · · · · · · · · · · · · · · · ·	Note: If SMC recoveries do not	meet acceptance criteria in san	nples chosen for the MS/N	ASD or diluted		
	Positive J	J J	J			
	Non-detect None	UJ	R			

Note: Surrogates in sample NAPL-C-31-DDL were outside evaluation criteria. All positive analytes were qualified estimated "J".

Field ID	Analyte(s)	Qualification	Code	Ru Justification
NAPL-C-31-DI	Chlorobenzene	J	S	680- Surrogate recovery high

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

	Yes	No	NA
Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate		-	
Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	7 X		
Using informed professional judgment, the data reviewer should use the MS and MSD results in			
conjunction with other QC criteria and determine the need for qualification of the data for samples from			
the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			
	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?  Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?  Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with other QC criteria and determine the need for qualification of the data for samples from	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?  Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?  Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?  Using informed professional judgment, the data reviewer should use the MS and MSD results in	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?  Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?  Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?  Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with other QC criteria and determine the need for qualification of the data for samples from

Note: Sample NAPL-B-138 was spiked and analyzed for VOCs and was within evaluation criteria.

#### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA
9.1	Is an LCS recovery form present?	- X		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	634752	х	
9.4	If Level IV, verify the % recoveries are calculated correctly.			Х
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			

Note: LCS/LCSD recoveries for acetone (150/144%) were outside QC limits (28-143%) in sample LCS/LCSD samples 680-45893/3 and 680-45893/4. Acetone was previously qualified due to continuing calibration, no further qualifications are required.

# 10.0 Internal Standards (Code I)

					Yes	No	NA
10.1	Are internal star	ndard areas for every sample	and blank within upper and	l lower QC limits?	X / 2 / 2		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			I
Note:	calibration, not sample, using ir	nformed professional judgmen	ion. Thus, if all other QC s	pecifications are met for a give e not to flag individual samples			
10.2		mes of internal standards with		ated calibration standard? positives or negatives exist. F	Or X		<u> </u>
		nagnitude, the reviewer may	•	ection of the data for non-detec			

Note: All internal standard area counts and retention times within evaluation criteria.

11.0 TCL Ide	ntification (Code W)	Yes	No	NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard	11.6		
	RRT in the continuing calibration?	X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample			
	mass spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

12.0 TCL/TI	C Quantitation and Reported Detection limits (Code K)	Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	X,		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	х	10 A 174	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note: Positive results were reported that exceed the linear range, but these samples were diluted and the diluted results were also reported.

13.0 Field D	uplicate Samples (Code F)	Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	Mark Con	Х	
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	<b>第</b>		X
	Action: No qualifying action is taken based on field duplicate results, however the data validator should			
	provide a qualitative assessment in the data validation report.			
Note:	No field duplicates were submitted for VOC analysis.			

# 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check C	QAPP or use 95% for aqueous	X		
14.2	Number of samples:	12			
14.3	Number of target compounds in each analysis:	34			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$				
	% Completeness	100			

#### DATA VALIDATION WORKSHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer: Tony Sedlacek	Project Name:	Sauget Area 2 Supp. Investigation
Date: 7/24/2006	Project Number:	21561683.80011
Laboratory Severn Trent Laboratory - Savannah	SDG No.:	SAS045
	Review Level:	Level III
Major Anomolies:	<del></del>	
No samples were rejected		
Minor Anomolies:		

Note:

Samples were qualified due to method blank contamination and  $r ^2 < 0.990$  in the initial calibration.

Field IDs: NAPL-A-(75-80) NAPL-A-(95-100) NAPL-B-(80-85) NAPL-B-(110-115)

NAPL-C-(20-25) NAPL-C-(65-70) NAPL-C-(100-105)

NAPL-A-(105-110) NAPL-B-(20-25)

NAPL-B-138 NAPL-C-31-D

TB-4

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA NA
1.	Do Chain-of-Custody forms list all samples analyzed?	X		
1.3	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	<b>X</b>		
1	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

The laboratory case narrative indicated compounds Bis (2-ethylhexyl) phthalate and Din-n-butyl phthalate were detected in method blank 680-45940. Surrogates recoveries were outside evaluation criteria for sample NAPL-B-138 MSD. MS/MSD recoveries were outside evaluation criteria in sample

# 2.0 Holding Time/ Preservation (Code H)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	* X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See		X	
İ	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2,3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		X	
Note:	All holding times were met.			

# 3.0 GC/MS Instrument Performance Check (Code T)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	79 X		
3.2	Have all samples been analyzed within twelve hours of the tune?	572 S-X		
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	3 × X		
	If no, all standards, blanks, field samples and QC samples are rejected "R".			

All DFTPP tuning met criteria. Note:

5/9/2007

#### 4.0 Blanks (Method Blanks and Field Blanks) (Code X - Field Blank Contamination, Code Z - Method blank contamination)

	Yes	No	<u>N</u> A
Is a Method Blank Summary form present for each batch?	Y X 4		
Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?	X	23.5	
Do any field equipment blanks have positive results (TCL, and/or TIC)?		X	
·			
**************************************	<del> </del>	l	
	Is a Method Blank Summary form present for each batch?  Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?  Do any field equipment blanks have positive results (TCL, and/or TIC)?  Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be qualified "U" and the detection limit elevated to the RL for estimate concentrations.  If Level IV, review raw data and verify all detections for blanks were reported.	Is a Method Blank Summary form present for each batch?  Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?  To any field equipment blanks have positive results (TCL, and/or TIC)?  Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be qualified "U" and the detection limit elevated to the RL for estimate concentrations.	Is a Method Blank Summary form present for each batch?  Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?  Do any field equipment blanks have positive results (TCL, and/or TIC)?  Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be qualified "U" and the detection limit elevated to the RL for estimate concentrations.

Di-n-butyl phthalate and Bis(2-ethylhexyl) phthalate were detected in method blank 680-45940/12-A. Di-n-butyl phthalate was nondetect in sample NAPL-B-138 and NAPL-C-31-D, no qualification of data was required. Bis(2-ethylhexyl) phthalate was detected in samples NAPL-B\_138 and NAPL-

Note: C-31-D less than 10X the blank concentration and was qualified "U".

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
NAPL-B-138	Bis(2-ethylhexyl) phthalate	Ŭ	Z	680-46657	MB contamination
NAPL-C-31-L	Bis(2-ethylhexyl) phthalate	U	Z	680-46657	MB contamination

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA	
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	A CONTRACT			
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?		X		
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			x	
5.3	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01 for poor responders like amines and phenols)? If yes, $J(+)/R(-)$ .		x		
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X			
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X	

Initial calibration compounds 2,4-Dinitrophenol (.988) and Benzo(b)fluoranthene (0.986) had r^2 values less than 0.990. All associated samples were nondetect for 2,4-Dinitrophenol and Benzo(b)fluoranthene, therefore were qualified "UJ".

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
NAPL-C-31-D	Benzo(b)fluoranthene	UJ	C	680-46978	r ^ 2 < 0.990
NAPL-B-138	2,4-Dinitrophenol	ŨĴ	С	680-46822	r ^ 2 < 0.990

#### 6.6 Atinuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	35 X 7		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	<b>经验证</b>	X	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	10000	x	
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	X	-	
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
6.5	Do any compounds have an RRF $< 0.05$ (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		<b>X</b>	
6.6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			X

A continuing calibration standard was not analyzed every 12 hours, but the samples were analyzed within 12 hours of the standard being analyzed. Compounds 2,4-Dinitrophenol (26.1%), 4-Nitrophenol (28.2%), 4-Nitroaniline (27.2%), 4,6-Dinitro-2-methylphenol (28.3%), N-Nitrosodiphenylamine (29.8%), 3,3'-Dichlorobenzidine (23.6%), Di-n-octylphthalate (24.7%), Benzo(b)fluoranthene (31.3%) and Indeno(1,2,3-cd) pyrene (21.8%) had %D outside of QC limits (%D < 20%). These compounds are associated with the continuing calibration sample that was analyzed with method blank 680-

Note: 45940/12-A, LCS sample 680-45940/13-A and NAPL-B-138 MS/MSD. Therefore, no qualification of data was required.

#### 7.0 Surrogate Recovery (Code S)

		Yes	No	<u>NA</u>
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?	X		
7.2	Are surrogate recoveries within acceptance criteria specified in the QAPP for all samples and method blanks?	Process of the second	X	
7.3	Are more than one of either fraction outside the acceptance criteria?	X	***	
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?		х	
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?			x
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.			
	> UCL 10% to LCL < 10%			
	Positive J J			
L	Non-detect None UJ R			

Surrogates phenol-d5, 2-fluorophenol and nitrobenzene-d5 were outside evaluation criteria in sample NAPL-B-138 MS/MSD. Surrogates outside evaluation criteria in MS/MSD samples do not require qualifications. Surrogates in all other samples were within evaluation criteria.

5/9/2007

8.0 ...rix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Laplicate (Recovery - Code M, RPD - Code D)

		Yes	190	NA.
8.1	[Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	My X		
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	X	•	
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?		X	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same			
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: Several analytes were outside QC limits for the MS/MSD sample, however the LCS was within QC limits; therefore, no qualification of data was

# 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	, NA
9.1	Is an LCS recovery form present?	<b>X</b>		
9.2	Is LCS analyzed at the required frequency for each matrix?	<b>X</b> ****		
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?	X		
	Action for specific compound outside the acceptance criteria: $R>UCL$ , $J(+)$ only; $LCL$ , $J(+)/UJ(-)$ ; $U(-)$ ; $U(-)$ 0 failures should be flagged "J" (+ only)			
9.4	If Level IV, verify the % recoveries are calculated correctly.			x

Note: All LCS were within criteria.

# 10.0 Internal Standards (Code I)

						Yes	No	NA
10.1	Are internal stan	dard area of every sample as	nd blank within upper and lo	wer QC limits for each co	ntinuing	12479	x	
		Area > +100%	Area < -50%	Area < -10%				
	Positive	J	J	J				
	Non-detect	None	UJ	R				
Note:	The method spec	ification is for the continuin	g calibration to be compared	to the mid-point initial ca	libration,			
	not sample to co	ntinuing calibration. Thus, i	f all other QC specifications	are met for a given sample	e, using		İ	
	informed profess	sional judgment, the reviewe	r may choose not to flag ind	ividual samples in this case	e.			
10.2	Are retention tim	nes of internal standards with	in 30 seconds of the associa	ted calibration standard?		X		
	Action: The chr	omatogram must be examine	d to determine if any false p	ositives or negatives exist.	. For shift			
	of a large magnit	tude, the reviewer may consi	der partial or total rejection	of the data for non-detects	in that			
	sample/fraction.		•				ĺ	

Note: Internal standards outside QC limits in the matrix spike duplicate for sample NAPL-B-138. MS/MSD samples are not qualified due to internal

# 11. L Identification (Code W)

		Yes	No	NA NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in			
	the continuing calibration?	_ X \ X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass			
	spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

# 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	X S		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X-44		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	5 m x 5 9		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		\$ X X X X X X X X X X X X X X X X X X X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note:

# 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA NA
13.1	Were any field duplicates submitted for SVOC analysis?	8935	X	
13.2	Were all RPD or absolute difference values within the control limits?	\$\$\$\times_12.52		X
	No action is taken based on field duplicate results, however the data validator should provide a qualitative			
	assessment in the data validation report.			

Note: No field duplicates were submitted for SVOC analysis.

# 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or	use 95% for aqueous sample,	X		
14.2	Number of samples:	12			
14.3	Number of target compounds in each analysis:	65			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
L	% Completeness	100			

#### DATA VALIDATI WORKSHEET WET CHEMISTRY ANALYSIS

Tony Sedlacek Project Name: Sauget - Area<sub>2</sub>2 Reviewer: 7/24/2006 Project Number: 21561683.80011 Date: Laboratory Severn Trent Laboratory - Savannah SDG No.: SAS045 Total Organic Carbon Review Level: Level III Test Name: Method No.: 9060

#### Major Anomolies:

No samples were rejected

#### **Minor Anomolies:**

No samples were qualified in this SDG.

Field IDs: NAPL-A-(75-80) NAPL-B-(80-85)

NAPL-C-(20-25)

NAPL-A-(95-100)

NAPL-B-(110-115)

NAPL-C-(65-70)

NAPL-A-(105-110)

NAPL-B-138

NAPL-C-(100-105)

NAPL-B-(20-25)

NAPL-C-31-D

TB-4

#### 1.0 Chain of Custody/Sample Condition

			Yes	No	NA_
Γ	1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
Γ	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X	

The laboratory case narrative, chain of custody, and cooler receipt did not indicate any problems. Note:

2.0 Holding	Time/ Preservation (Code h)	Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		7 X	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		X	-

Note: All holding times were met.

#### 3.0 Blanks (Method Blanks and Field Blanks) (Code x - Field Blank Contamination, Code z - Method blank contamination)

		Yes	No	NA_
3.1	Is a Method Blank Summary form present for each batch?	(X 5 %)		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?			х
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X
Note:	Field/rinse/equipment blanks were not part of this SDG.			

#### 4.0 Initial Calibration (Code c)

 		Yes	No_	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?		X	
4.2	Are correlation coefficients stable (>0.995) over the concentration range of the instrument?			X
	If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.			X
 Note:	Initial calibration forms were not present but continuing calibration forms were present.			

#### 5.0 Continuing Calibration (Code r)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	A. X		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	X		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X	
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %R < 50%, flag R.			
5.4	If Level IV, calculate a sample of %Rs.			X

Note: All continuing calibrating criteria was met.

6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA
6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	<b>X</b>		
6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	x ÷		ļ
6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	A. WX		
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
	other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			
	Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: MS/MSD recoveries were within QC limits.

# 7.0 Laboratory Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD)

		Yes	No	NA
7.1	Is an LCS recovery form present?	***X***		
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	7.00 X 18.00		
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X		
7.4	If Level IV, verify the % recoveries are calculated correctly.			X
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; <lcl, "j"="" (+="" <30%="" be="" failures="" flagged="" j(+)="" only)<="" r(-).="" rpd="" should="" td="" uj(-);=""><td></td><td></td><td></td></lcl,>			

Note: All LCS recoveries are within evaluation criteria.

# 8.0 Analyte Identification

_			Yes	No	NA
	8.1	Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the			
L		standard RRT in the continuing calibration?			х

Note:

# 9.0 Analyte Quantitation and Reported Detection limits

		Yes	No	NA
9.1	Are RLs used consistent with those specified in the QAPP?	OAN X VA		
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?		X	
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		<b>X</b> *	
9.4	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note: Reporting limits were not adjusted due to samples not requiring dilutions and percent solids did not affect the RLs.

# 10.0 Field Duplicate Samples (Code f)

_			Yes	No	NA.
	10.1	Were any field duplicates submitted?	种类型色	X	
	10.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?			х
		Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
L		qualitative assessment in the data validation report.			

Note: Field duplicates were not submitted for TOC analysis.

# 11.0 Laboratory Duplicates (Code k)

	·	Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with duplicate results.	X*==		
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		X	
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± PQL for aqueous, and RPE < 35% or difference < ± 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	7 C 200 000 000 000 000 000 000 000 000 0		

Note: Sample NAPL-C-(65-70) was duplicated by the laboratory and all RPD's were within criteria.

# .J Data Completeness

 			Yes	No	NA.
12.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample, 90%	X		
12.2	Number of samples:	12			
12.3	Number of target compounds in each analysis:	1			
12.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	100			

SDG No: SAS046



# DATA VALIDA. JN WORKSHEET VOLATILE ORGANIC ANALYSIS

Reviewer: Tony Sedlacek **Project Name:** Sauget - Area 2 7/21/2006 Project Number: 21561683.80011 Date: Laboratory Severn Trent Laboratory - Savannah SDG No.: **SAS046** Level III Review Level: Major Anomolies: No samples were rejected **Minor Anomolies:** Analytes chloromethane and bromomethane had %D > 20% between the ICAL and CCAL and required qualification in all associated samples. Field IDs: OSAA-1-26 OSAA-1-106 TB-7 AA-P-10-62

UAA-11-82

UAA-11-102

AA-P-10-22

AA-P-10-42

TB-8

AA-P-10-82

AA-P-10-102

AA-P-10-102-D AA-P-10-118.5

UAA-11-22

UAA-11-42

UAA-11-62

UAA-11-62-D

# 1.0 Chain of Custody/Sample Condition

TB-6

OSAA-1-46

OSAA-1-66

OSAA-1-86

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note: The laboratory case narrative indicated the MSD recovery was outside evaluation criteria for chloroethane in sample AA-P-10-42.

#### 2.0 Holding Time/ Preservation (Code H)

						Yes	No	NA
2.1	Do sample preservat	ion, collection and stor	age condition meet me	ethod requirement?		X		
	If sample preservation	n and/or temperature v	vas inappropriate (i.e.,	<2° >6°C, etc.), comment in re	port. If			,
	unpreserved or temp	erature is outside the ra	inge 0° (but not frozen	) to 10° flag all positive results	with a		,	
	"J" and all non-detec	ts "UJ". If temperature	e exceeds 10°, flag pos	itive detections "J" and non-det	ects		ļ	
2.2		<del></del>		ate of analysis, been exceeded?			X	
	Matrix	Preserved	Aromatic	All others				
	Aqueous	No	7 days	14 days				
		Yes	14 days	14 days				
	Soil/Sediment	4 °C ± 2 °C	14 days	14 days				
2.3			ssly (twice the holding	time) exceeded? If yes, J(+)/R	(-).		X	
Note:	All holding times we	re met.						

#### 3.0 GC/MS Instrument Performance Check (Code T)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	X		
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	X. Car		
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	<b>X</b> X		

Note: All tuning criteria was met.

# 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

	Yes	No	NA
Is a Method Blank Summary form present for each batch?	X		
Do any method blanks have positive VOA results (TCL and/or TIC)?		* <b>X</b> * %	
Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?		X	
Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride,			
acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated			
to the RL for estimate (laboratory "J" flagged) concentrations.			
If Level IV, review raw data and verify all detections for blanks were reported.			x
	Do any method blanks have positive VOA results (TCL and/or TIC)?  Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?  Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.	Is a Method Blank Summary form present for each batch?  Do any method blanks have positive VOA results (TCL and/or TIC)?  Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?  Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.	Is a Method Blank Summary form present for each batch?  Do any method blanks have positive VOA results (TCL and/or TIC)?  Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?  Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.

Note: All blanks met criteria.

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.	Are Initial Calibration summary forms present and complete for each instrument used?	X		
	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	X		
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.0	1		
	for poor responders like ketones or alcohols)? If yes, $J(+)/R(-)$ .		X	
5.	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.			
5.	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: Initial calibration was within criteria.

#### 6.0 Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?		Х	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	X,		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	x		
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		* X Table	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			Х

Note:

A continuing calibration standard was not analyzed every 12 hours, although samples were analyzed with 12 hours of standards being run. Compounds chloromethane (-22.5%) and bromomethane (-45.0%) had %D outside QC limits, all associated data was nondetect and was qualified estimated nondetect "UJ".

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
OSAA-1-26	Chloromethane	UJ	C	680-47063	%D > 20%
OSAA-1-26	Bromomethane	UJ	C	680-47063	D > 20%
OSAA-1-46	Chloromethane	UJ	С	680-47063	D > 20%
OSAA-1-46	Bromomethane	UJ	C	680-47063	D > 20%
OSAA-1-66	Chloromethane	UJ	С	680-47063	D > 20%
OSAA-1-66	Bromomethane	UJ	С	680-47063	D > 20%
OSAA-1-86	Chloromethane	UJ	С	680-47063	D > 20%
OSAA-1-86	Bromomethane	UJ	C	680-47063	%D > 20%
OSAA-1-106	Chloromethane	UJ	С	680-47063	%D > 20%
OSAA-1-106	Bromomethane	UJ	С	680-47063	D > 20%
UAA-11-22	Chloromethane	UJ	С	680-47063	%D > 20%
UAA-11-22	Bromomethane	UJ .	C	680-47063	$^{\circ}$ %D > 20%
UAA-11-42	Chloromethane	UJ	С	680-47063	D > 20%
UAA-11-42	Bromomethane	UJ	C	680-47063	%D > 20%
UAA-11-62	Chloromethane	UJ	C .	680-47063	%D > 20%
UAA-11-62	Bromomethane	UJ	C	680-47063	D > 20%
UAA-11-62-D	Chloromethane	·UJ	C	680-47063	D > 20%
UAA-11-62-D	Bromomethane	UJ	C	680-47063	D > 20%
UAA-11-82	Chloromethane	UJ	C	680-47063	D > 20%
UAA-11-82	Bromomethane	UJ	C	680-47063	D > 20%
UAA-11-102	Chloromethane	UJ	C	680-47063	%D > 20%
UAA-11-102	Bromomethane	UJ	Ċ.	680-47063	D > 20%
AA-P-10-22	Chloromethane	UJ	С	680-47063	D > 20%
AA-P-10-22	Bromomethane	UJ	С	680-47063	D > 20%
AA-P-10-42	Chloromethane	UJ	С	680-47063	%D > 20%
AA-P-10-42	Bromomethane	UJ	С	680-47063	D > 20%
AA-P-10-82	Chloromethane	UJ	С	680-47063	%D > 20%
AA-P-10-82	Bromomethane	UJ	С	680-47063	%D > 20%
AA-P-10-102	Chloromethane	UJ	С	680-47063	%D > 20%
AA-P-10-102	Bromomethane	UJ	С	680-47063	%D > 20%
AA-P-10-102-D	Chloromethane	UJ	C	680-47063	%D > 20%
AA-P-10-102-D	Bromomethane	UJ	· C	680-47063	%D > 20%
AA-P-10-118.5	Chloromethane	UJ	С	680-47063	%D > 20%
AA-P-10-118.5	Bromomethane	UJ	C	680-47063	%D > 20%

## 7.0 Surrogate Recovery (Code S)

					Yes	No	NA
7.1	Are all sampl	es listed on the ap	propriate Surrogate Recovery S	ummary Form ?	**************************************		
7.2			acceptance criteria specified in		7 X		
7.3	If No in Secti	on 7.2, were these	e sample(s) or method blank(s) re	eanalyzed?			X
7.4	If No in Sectiout.)	on 7.3, is any sam	aple dilution factor greater than 1	0? (Surrogate recoveries ma	y be diluted		X
		recoveries do no no reanalysis is r	ot meet acceptance criteria in sam equired.	nples chosen for the MS/MSD	or diluted		
		> UCL	10% to LCL	< 10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			

Note: All surrogate recoveries within evaluation criteria.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	X		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?		X	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in			
	conjunction with other QC criteria and determine the need for qualification of the data for samples from			
<u>L</u>	the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: The MSD recovery for chloroethane (196%) was outside evaluation criteria (40-171%) in sample AA-P-10-42. The Matrix spike recovery and RPD were within evaluation and the LCS/LCSD was within criteria. No qualification of data was

### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

			Yes	No	NA
	9.1	Is an LCS recovery form present?	<b>X X X 3 3</b>		
	9.2 Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?		X		
	9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X		· ]
	9.4	If Level IV, verify the % recoveries are calculated correctly.			X
		Action for specific compound outside the acceptance criteria: %R>UCL,			
L		J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			

Note: All LCS recoveries within evaluation criteria.

#### 10.0 Internal Standards (Code I)

				·	Yes	No	NA.
10.1	Are internal star	ndard areas for every sample	and blank within upper and	l lower QC limits?	T X		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
Note:	The method spe	cification is for the continuin	g calibration to be compare	d to the mid-point initial			
	calibration, not	sample to continuing calibrat	ion. Thus, if all other QC s	pecifications are met for a give	n		
	sample, using in	formed professional judgmer	nt, the reviewer may choose	not to flag individual samples	in		
10.2	Are retention tir	nes of internal standards with	in 30 seconds of the associ	ated calibration standard?	** <b>x</b> ***		
	Action: The chi	romatogram must be examine	ed to determine if any false	positives or negatives exist. For	r		
	shift of a large r	nagnitude, the reviewer may	consider partial or total reje	ction of the data for non-detec	s		
	in that sample/fi	raction.	•				

Note: All internal standard area counts and retention times within evaluation criteria.

#### 11.0 TCL Identification (Code W)

		Yes	No	NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

#### 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	<b>X</b>		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	<b>X</b>		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	х	<b>数型。参</b>	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note:

Chlorobenzene exceeded the linear range of the instrument in samples UAA-11-102 and AA-P-10-118.5 the samples were diluted (1:2) and (1:5) and the results were within the linear range of the instrument.

#### 13.0 Field Duplicate Samples (Code F)

 		Yes	No	NA.
13.1	Were any field duplicates submitted for VOC analysis?	X		
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	X		
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a qualitative assessment in the data validation report.			

Note: Samples UAA-11-62 and AA-P-10-102 were duplicated and analyzed for VOCs. No qualification of data was required.

## 14.0 Data Completeness

 			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check C	APP or use 95% for aqueous	X		
	sample, 90% for soil sample)		85-14		
14.2	Number of samples:	10			
14.3	Number of target compounds in each analysis:	34		•	
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$				
·	% Completeness	100			

6of6

Note:

# DATA VALIDATA N WORKSHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer: Tony Sedlacek
Date: 7/28/2006
Laboratory Severn Trent Laboratory - Savannah

Major Anomolies:
No samples were rejected

Project Name: Sauget Area 2 Supp. Invest.
Project Number: 21561683.80011

SDG No.: SAS046
Review Level: Level III

Major Anomolies:

Minor Anomolies:

Samples were qualified due to extractions outside of holding time and high/low surrogate recoveries.

Field IDs:	OSAA-1-26	OSAA-1-106	TB-7	AA-P-10-62
	OSAA-1-46	UAA-11-22	UAA-11-82	TB-8
	OSAA-1-66	UAA-11-42	UAA-11-102	AA-P-10-82
	OSAA-1-86	UAA-11-62	AA-P-10-22	AA-P-10-102
	TB-6	UAA-11-62-D	AA-P-10-42	AA-P-10-102-D
		•		AA-P-10-118.5

#### 1.0 Chain of Custody/Sample Condition

 		Yes	No	INA.
1.1	Do Chain-of-Custody forms list all samples analyzed?	X TX		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	x		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
	of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated surrogate recovery was outside evaluation criteria for 2-fluorophenol and 2-fluorobiphenol in sample UAA-11-22 and for 2-fluorophenol, 2-fluorobiphenol, nitrobenzene-d5 and 2,4,6-tribromophenol in sample UAA-11-102. MS/MSD recoveries for 3,3-dichlorobezidine were outside evaluation criteria for sample AA-P-10-42. The grand mean exception was stated to have been applied to the initial calibration and ICV. The raw data was reviewed and the grand mean was not found to be used, all calibration met evaluation criteria.

#### 2.0 Holding Time/ Preservation (Code H)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler	;		
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	x		
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2,3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		** - X / .**	

Note: Samples OSAA-1-26, OSSA-1-46 and OSAA-1-66 were extracted approximately 1-3 hours outside holding times. All analytes were non-detect in all associated samples and were qualified estimated nondetect "UJ".

	Field ID	Analyte(s)	Qualification	Code	Run #	Justification
1	OSAA-1-26	All SVOCs	UJ	Н	680-47503	Extracted out of Hold time
[	OSAA-1-46	All SVOCs	UJ	Н	680-47503	Extracted out of Hold time
٦	OSAA-1-66	All SVOCs	UJ	Н	680-47595	Extracted out of Hold time

#### 3.0 GC/MS Instrument Performance Check (Code T)

		Yes	No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	* X		
3.2	Have all samples been analyzed within twelve hours of the tune?	X		
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	X		
	If no, all standards, blanks, field samples and QC samples are rejected "R".			

Note: All tuning criteria were met.

#### 4.0 Blanks (Method Blanks and Field Blanks) (Code X - Field Blank Contamination, Code Z - Method blank contamination)

			Yes	No	NA
	4.1	Is a Method Blank Summary form present for each batch?	X.		
	4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?		THE X	
	4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?		$\mathbf{X}^{*}$	
li		Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be			
		qualified "U" and the detection limit elevated to the RL for estimate concentrations.			
	4.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: All blanks met criteria.

## 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	<b>X</b> 3		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?		X	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	Do any SPCC compounds have an RRF les than specification or any other compounds < 0.05 (use 0.01 for poor responders like amines and phenols)? If yes, $J(+)/R(-)$ .		X	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: Initial calibration met criteria. The grand mean exception was stated to have been applied to the initial calibration and ICV. The raw data was reviewed and the grand mean was not found to be used, all calibration met evaluation criteria.

#### 6.0 Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	tisking x back		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	54535	x	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	(*************************************		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	×	1 1	
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X X	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			X

Note:

A continuing calibration standard was not analyzed every 12 hours, although all samples were analyzed within 12 hours of a continuing calibration being analyzed. Compounds Indeno(1,2,3-cd) pyrene (33.2%) for calibration date 6/13, Indeno(1,2,3-cd) pyrene (25.7%) for calibration date 6/14, Indeno(1,2,3-cd) pyrene (39.8%), Dibenzo (a,h) anthracene (25.6%) and Benzo (g,h,i) perylene (25.3%) for calibration date 6/15. All associated analytes in samples were nondetect, therefore no qualification of data was required.

#### 7.0 Surrogate Recovery (Code S)

					Yes	No	NA
7.1			propriate Surrogate Recovery S		CERTAIN NO.		
7.2				the QAPP for all samples and method blanks?	27 <b>30 1</b>	X	
7.3			tion outside the acceptance crit		х	A CONTRACTOR	
7.4	If Yes in Sect	ion 7.3, are these s	ample(s) or method blank(s) re	analyzed?		x	
7.5	If Yes in Sect	ion 7.3, is any sam	ple dilution factor greater than	10?		X	
			y unacceptable recoveries in the neutrals are assessed separately.	e MS and/ or diluted samples, then no reanalys	is		
		> UCL	10% to LCL	< 10%			<del></del>
	Positive	J	J	J			
	Non-detect	None	UJ	R			

Note:

Surrogate recoveries for 2-fluorophenol (53%) was outside evaluation criteria (56-100%) and 2-fluorobiphenol (56%) was outside evaluation criteria (59-103%) in sample UAA-11-22. All analytes in sample UAA-11-22 were nondetected and qualified estimated nondetect "UJ". Surrogate recoveries were outside evaluation criteria for 2-fluorophenol (101%) with criteria (56-100%), 2-fluorobiphenol (107%) with criteria (59-103%), nitrobenzene-d5 (114%) with criteria (60-102%), and 2,4,6-tribromophenol (133%) with criteria (55-126%) in sample UAA-11-102. All detected analytes were qualified estimated "J" in sample UAA-11-102.

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
UAA-11-22	All nondetects	UJ	S	680-47378	Low surrogate recovery
UAA-11-102	1,4-Dichlorobenzene	J	S	680-47378	High surrogate recovery

8.0 Ma...x Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

			Yes	No	NA NA
	8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	是一个文字。		
	8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	3 × x		
Е	8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?		X	
		with other QC criteria and determine the need for qualification of the data for samples from the same			
		site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note:

MS/MSD recoveries for 3,3-Dichlorobezidine (18/16%) were outside evaluation criteria (29-101%) in sample AA-P-10-42, however the LCS recoveries were within QC limits; therefore, no qualification of data was required.

#### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA
9.1	Is an LCS recovery form present?	X		
9.2	Is LCS analyzed at the required frequency for each matrix?	X	-	
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?	* <b>X</b>		
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; <lcl, <30%<="" j(+)="" td="" uj(-);=""><td></td><td></td><td></td></lcl,>			
ļ	J(+)/R(-). RPD failures should be flagged "J" (+ only)	1		
9.4	If Level IV, verify the % recoveries are calculated correctly.			X

Note: All LCS met criteria.

#### 10.0 Internal Standards (Code I)

					Yes	No	NA
Po Note: sa in 10.2 A	Are internal standard area of every sample and blank within upper and lower QC limits for each continuing calibration?				X		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
Note:	sample to continuing calibration. Thus, if all other QC specifications are met for a given sample, using informed professional judgment, the reviewer may choose not to flag individual samples in this case.						
10.2	Are retention times of internal standards within 30 seconds of the associated calibration standard?				X		
	a large magnitude, the reviewer may consider partial or total rejection of the data for non-detects in that sample/fraction.						

Note: All Internal standards met criteria.

## 11.0 TCL Identification (Code W)

<u> </u>		Yes	No	NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

## 12.0 T .... FIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	STORY NO.		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	4.75 £ £ £ <b>£</b> \$		х
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X 100 A		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		XXXXX	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note: Samples did not require a dilution.

## 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA NA
13	Were any field duplicates submitted for SVOC analysis?	SA STATE		
13	Were all RPD or absolute difference values within the control limits?			X
	No action is taken based on field duplicate results, however the data validator should provide a qualitative			
	assessment in the data validation report.			

Note: Samples UAA-11-62-D was a duplicate of UAA-11-62 and AA-P-10-102-D was a duplicate of AA-P-10-102.

## 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAP)	P or use 95% for aqueous sample, 90%	<b>X</b> :		
	for soil sample)				_
14.2	Number of samples:	20			
14.3	Number of target compounds in each analysis:	65			
14.4	Number of results rejected and not reported:	0		_	
	% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
L	% Completeness	100	<u></u>		

Note: All data was usable.

## DATA VALIDAT WORKSHEET HERBICIDES ANALYSIS

 Reviewer:
 Tony Sedlacek
 Project Name:
 Sauget - Area 2

 Date:
 7/31/2006
 Project Number:
 21561683.80011

 Laboratory
 Severn Trent Laboratory - Savannah
 SDG No.:
 SAS046

 Review Level:
 Level III

#### Major Anomolies:

Pentachlorophenol was rejected in all herbicide samples due to zero recovery in MS/MSD sample AA-P-10-42.

#### Minor Anomolies:

No other qualifications of data were required.

Field IDs:	OSAA-1-26	OSAA-1-106	TB-7	AA-P-10-62
	OSAA-1-46	UAA-11-22	UAA-11-82	TB-8
	OSAA-1-66	UAA-11-42	UAA-11-102	AA-P-10-82
	OCA 4 1 06	TTA A 11 CO	A A D 10 22	4 A D 10 100

OSAA-1-86 UAA-11-62 AA-P-10-22 AA-P-10-102
TB-6 UAA-11-62-D AA-P-10-42 AA-P-10-118.5

#### 1.0 Chain of Custody/Sample Condition

 		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X-call		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x	47.7	

Note:

The laboratory case narrative indicated MS/MSD recoveries were outside evaluation criteria for dichloroprop and pentachlorophenol in sample AA-P-10-42. The grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds in the CCV is less than or equal to 15%.

2.0 Holding	g Time/ Preservation (Code h)	Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	· X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		a X	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		X	

Note: All holding times were met.

#### Blanks (Method Blanks and Field Blanks)

(Code x - Field Blank Contamination, Code z - Method blank contamination)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?	, X		
3.2	Do any method blanks have positive results?		*X	
3.3	Do any field/rinse/equipment blanks have positive results?		X (1)	
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be			
	elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: All Method blanks met criteria.

#### 4.0 Initial Calibration (Code r)

_			Yes	No	NA
	4.1	Are Initial Calibration summary forms present and complete for each instrument used?	X		
	4.2	Are calibration factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument	X		
Г		If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
	4.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: Initial calibration was met.

#### 5.0 Continuing Calibration (Code c)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	<b>X</b>		
5.2	Has a continuing calibration standard been analyzed every 12 hours?	X.,		
5.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 20%)?	x		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
5.5	If Level IV, calculate a sample of CFs and %Ds from ave CF to verify correct calculations.			X

The grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds in the CCV is less than or equal to 15%. The CCV was within evaluation criteria by applying the grand mean, no qualification of data was required.

## 6.0 Surrogate Recovery (Code s)

Note:

				Yes	No	NA
6.1	Are all samples listed on the a	ppropriate Surrogate Recovery	Summary Form ?	(i x x		
6.2	Are surrogate recoveries withi	n acceptance criteria specified in	the QAPP for all samples?	<b>X</b> X		
6.3	If No in Section 6.2, were thes	se sample(s) or method blank(s)	reanalyzed?			X
6.4	If No in Section 6.3, is any sai	mple dilution factor greater than	10? (Surrogate recoveries may be diluted out.)			х
	> UCL	10% to LCL	< 10%			
	Positive J	J	J	T " 1		
	Non-detect None	UJ	R			

Note: All surrogate recoveries met evaluation criteria.

7.. Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Samp. Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	TX 1		
7.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	X		
7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	2007 TO 1200	X	
-	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same	1		
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Sample AA-P-10-42 was spiked and MS recoveries for dichlorprop (152%) and RPD (48) were outside evaluation criteria (43-106%) and RPD < 40. LCS recoveries were within evaluation criteria and all analytes were non-detect, therefore no qualification of data was required. Compound 2,4-DB had a RPD of 59 which is outside evaluation criteria of < 40. The MS/MSD recoveries were within evaluation criteria, no qualification of data was required. MS/MSD recoveries for pentachlorophenol (0/0%) were outside evaluation criteria of (46-144%) and was qualified rejected "R" in sample AA-P-10-42.

Note:

Field ID	Analyte(s)	Qualification	Code	Run#	Justification
AA-P-10-42	Pentachlorophenol	R	m	680-47277	MS/MSD recovery of < 10%

#### 8.0 Laboratory Control Sample (LCS/LCSD) (Code l - LCS recovery Code e - RPD)

		Yes	No	NA_
8.1	Is an LCS recovery form present?	<b>X X X X</b>		
8.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
8.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	<b>.X</b>		
8.4	If Level IV, verify the % recoveries are calculated correctly.			x
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			
Note:	All LCS recoveries met evaluation criteria.			

#### 9.0 TCL Identification (Code w)

Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	-	

Note:

### 10.0 TCL Quantitation and Reported Detection limits (Code p)

		Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?	X X		
10.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	SOME STATE	х	
10.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		POX'S	
10.4	If Level IV, calculate a sample of positive results to verify correct calculations			x

Note: Samples did not require dilutions.

_	Field I	Duplicate Samples (Code f)	Yes	No	NA
	11.1	Were any field duplicates submitted for herbicide analysis?	X		
	11.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	X X	_	
		Action: No qualifying action is taken based on field duplicate results, however the data validator should	_		
		provide a qualitative assessment in the data validation report.			

Note: Samples UAA-11-62-D was a duplicate of UAA-11-62 and AA-P-10-102-D was a duplicate of AA-P-10-102, no qualification of data was required.

## 12.0 Data Completeness

			Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit: Check C	APP or use 95% for aqueous sample,	38.674.80	X	
12.2	Number of samples:	18			
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:	18			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	90			

Note: Pentachlorophenol was rejected in all herbicide samples due to zero recovery in MS/MSD sample AA-P-10-42.

# DATA VALIDATION WORKSHEET - Level III Review Inorganic - ICP, ICP-MS, GFAA, and CVAA

Reviewer: Date: Laboratory		Tony Se 7/31/ Severn Trent Labo	2006				oject Nu			1683.8001	1		
Laboratory		Severi Trent Labo	latory - Savannan	<del></del>					Level				<del></del>
lajor Anomolie										<del></del>			
	No samples were re	ected	<del></del>										
linor Anomolie	·c•								•				
·		red qualification due to ana	vtes detected in continu	ing calibration blank, I	CS conc	entration	ns less th	an IDL	and lab	duplicate I	RPD gre	eater than	1 20%
	and MS recovery an												
eld IDs:	OSAA-1-26	OSAA-1-106	TB-7	AA-P-10-62		AAD	10-118.5						
eig IDS.	OSAA-1-26 OSAA-1-46	UAA-11-22	UAA-11-82	TB-8		AA-F-	10-116.5	1					
	OSAA-1-46	UAA-11-42	UAA-11-102	AA-P-10-82									
	OSAA-1-86	UAA-11-62	AA-P-10-22	AA-P-10-102									
	TB-6	UAA-11-62-D	AA-P-10-42	AA-P-10-102-D									
						<del></del>		× 76	T 05				
0 Chain of Cu	stody/Sample Cond	ition/Raw Data			Yes	ICP No IN		P-MS VolNA	GFA Yes I No	NA Yes	AA-H	g NA	τ
1.1	Do Chain-of-Custoc	ly forms list all samples that	were analyzed?		X.	1,0 1,		10 1		\$ X.00	<del></del>		<del></del>
1.2		stody forms signed, indicati		ody was maintained?	<b>X</b>				34%	X			
5		rts, chain-of-custody, and la				<b>3</b>	i i						
	· ·	of samples, analytical prol	•	•	1					4X			
	quality of the data?	1 , , ,			x						.X		
1.4	Does sample preser	vation, collection and stora	ge meet method requirer	ment? (water samples:					2250	246			
		oH < 2, and soil/sediment sa			X			İ		X			
1.5		ogs present and complete w		veights, dilutions, final			200	$\dashv$	6.50		-		
1,0		(for soil samples), and prep			15.0								
	1	tact the laboratory for explain	•		X		5.5			l X			
Note:	The laboratory case	narrative indicated potassiu	m was detected in the me	ethod blank. The MS r	ecoverv	was out	side of e	valuati	on criteria	for potas	sium. T	he MS/N	/ISD
	= = = = = = = = = = = = = = = = = = = =	num, calcium, iron, magnes											
0 Holding Tin	ne (Code h)					ICP		P-MS	GFA		AA-H		
	<del>,</del>				Yes		A Yes	No NA	Yes No	NA Yes	No	N A	<u>\</u>
2.1	Have any technical	holding times, determined t	rom date of collection to	o date of analysis, been	:}	1.62	1						
	exceeded? (Hg: 280	lays, other metals: 6 months	) See attached Holding	Time Table.		X 23	يُّا				X		
	Action: $J(+)/UJ(-)$ .	If the holding times are gro	ssly exceeded (twice the	holding time criteria)									
	J(+)/R(-).	5	•	-			1			<b>S</b>			
Note:		nalyzed within holding time	criteria		<del>!</del>			y - 30.77 1	1 2000		11.7.7.1		

3.0 Instrume	nt Calibration (Code c)						ICP	1 -	CP-MS	GFA		g
						Yes	No 1	VA Yes	No NA	Yes No	NA Yes No	NA
3.1	Are sufficient standards standard; GFAA: blank + t	included in	the calibration c	urve? (ICP/ICP-I	MS: blank + one						3.3	
	standard; GFAA: blank + t	hree standard	s; CVAA: blank +	five standards)		** <b>X</b>	1	300			X	
3.2	Are the correlation coeffici	ients > 0.995'	? (for GFAA and (	CVAA) Action: J(	(+)/UJ( <b>-</b> ).						X	
3.3	Action: If no, use professi narrative.	onal judgme	nt to determine af	fect on the data an	d note in reviewer	X					X	
3.4	Was continuing calibration whichever is more frequen the data and note in review	verification t? Action: I	(CCV) performed f no, use profession	l every 10 analysis onal judgment to d	s or every 2 hours, etermine affect on	x					ĭ	
3.5	Are all calibration standa Mercury (80%-120%) and			nd CCV) within t	the control limits?							
	Action:	R(+/-)	J(+)/UJ(-)	J(+)	R(+)	X				14123	2 X	
	Mercury	< 65%	65% - 79%	121% - 135%	> 135%	S. A. S. S.				三种		
	Other Metals	< 75%	75% - 89%	111% - 125%	> 125%	2000 PM		-2016		23/2	<b>148.00</b> 2	

Note: Correlation coefficients were not listed for CVAA, the standards were listed in %RSD and all were within evaluation criteria.

#### 4.0 Blanks (Code o - Calibration blank failure, Code p - Preparation blank failure, Code x - Field blank failure)

			ICP		ICP-			FAA		AA-I	Ig	
		Yes	No	NA Ye	s N	o NA	Yes	No I	NA Yes	No	NA	
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X							X			
4.2	Are there reported PB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x								X		
4.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	X							X		· · · · · · · · · · · · · · · · · · ·	
4.4	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data to note in reviewer narrative.	x							X			
4.5	Are there reported ICB or CCB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.					0.				x		
4.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	x								X.		
4.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		X							X	_	

Note:

Potassium was detected in the method blank, all potassium results were greater than 5X the blank value, no qualification of data was required. Beryllium was detected in the continuing calibration blanks in samples OSAA-1-46 (.00057mg/L), OSAA-1-86 (.00039mg/L), OSAA-1-106 (.00028 mg/L), AA-P-10-62 (.00041 mg/L), AA-P-10-82 (.00082 mg/L), AA-P-10-102 (.00048 mg/L), AA-10-102-D (.00039 mg/L) and AA-P-10-118.5 (.00049 mg/L).

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
OSAA-1-46	Beryllium	Ü	0	680-47622	Detected in CCB
OSAA-1-86	Beryllium	U	0	680-47878	Detected in CCB
OSAA-1-106	Beryllium	U	0	680-47878	Detected in CCB
AA-P-10-62	Beryllium	U	0	680-47878	Detected in CCB
AA-P-10-82	Beryllium	U	0	680-47878	Detected in CCB
AA-P-10-102	Beryllium	U	0	680-47878	Detected in CCB
AA-10-102-D	Beryllium	Ü	0	680-47878	Detected in CCB
AA-P-10-118.5	Beryllium	U	0	680-47878	Detected in CCB

erence Check Sample (ICS) (Code n)														י פ
			Yes	No	NA	Yes	No	NA	Yes	No	NA Y	es	No	NA
Was ICS AB analyzed at beginning of the beginning or once every 8 hours (v	each ICP run (or at least twice every 8 hounichever is more frequent) for ICP-MS?	rs), and at	X											
Are the ICS AB recoveries within 80%	- 120%?		X											
Are the results for unspiked analytes (	1 ICS A) < + IDL?			X										
If not, are the associated sample Al, (ICS?	a, Fe, and Mg concentrations less than the l	evel in the	X											_
<pre>Action: Not Spiked Analytes &lt;-IDL &gt; IDL</pre>	< 50% 50% - 79% > 120	) )%												
	Are the ICS AB recoveries within 80% Are the results for unspiked analytes (ir  If not, are the associated sample Al, C ICS? Action: Not Spiked Analytes	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the le ICS?  Action:  Not Spiked Analytes  Spiked analytes (ICS AB analytes  Spiked analytes (ICS AB analytes)  Spiked analytes (ICS AB analytes)  Spiked analytes (ICS AB analytes)	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample AI, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%	Are the ICS AB recoveries within 80% - 120%?  Are the results for unspiked analytes (in ICS A) < + IDL?  If not, are the associated sample AI, Ca, Fe, and Mg concentrations less than the level in the ICS?  Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)  <-IDL > IDL < 50% 50% - 79% > 120%

Note: Barium (.0022 mg/L), chromium (.0011 mg/L), manganese (.0058 mg/L), vanadium (.0027 mg/L) and zinc (.0118 mg/L) results were greater than the IDL in ICS A. All associated samples in which these analytes are detected were qualified estimated "J".

Field ID	Analyte(s)	Qualification	Code	Run#	Justification
All metals	Barium	J	n	680-47878	ICS < IDL
All metals	Chromium	j	n	680-47878	ICS < IDL
All metals	Manganese	J	n	680-47878	ICS < IDL
All metals	Vanadium	J	n	680-47878	ICS < IDL
All metals	Zinc	J	n	680-47878	ICS < IDL

Laborato	ry Control Sa	mple (LCS) (C	ode I - Recov	ery, Code e - R	PD)			ICP		ICP-MS	GF	AA	CVAA-	Hg
							Yes	No :	NA Ye	NoN	A Yes N	lo NA	Yes No	NA
6.1	Was an LC per matrix	CS prepared and and per level)?	d analyzed at Action: If no	the correct frequency, J(+) any sample	uency (one per 2 e not associated	0 samples, per batch, with LCS results.	x		7.3				X	
6.2	Is any LCS		de the control	limits? (Aqueou		20% - except Ag and		x			(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)			
	Action:	< LCL	olid > UCL	< 50%	Aqueous 50% - 79%	> 120%		(#2.25) 632.25					250 250	
		J(+)/UJ(-)	J(+)	R(+/-)	J(+)/UJ( <b>-</b> )	J(+)		2.0			(4		34 mag 2 m	

Note: All recoveries were within QC criteria.

Laborato	ry Duplicates (Code k)		ICP		I	CP-M	S	GFA	Ā	CVA	A-Hg
		Yes	No	ΝA	Yes	Noll	VA Yes	No	NA	Yes N	o NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.	)     <b>x</b>						The state of the s		x	
7.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professiona judgment. Note in worksheet.	1	x.			43					
7.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQI for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.		2527 K							x	

Note:

Sample AA-P-10-42-D was duplicated by the lab and aluminum (21.9%) had an RPD value outside evaluation criteria of <20%. Aluminum was detected in the sample and was qualified estimated "J".

Field ID	Analyte(s)	Qualifications	Code	Run#	T	Justification
AA-P-10-42-D	Aluminum	Ĵ	k	680-47878		Lab Dup RPD < 20%

8.0 Spike Sampl	le Analysis -Pre-	-Digestion (Code m	- Recovery, Code d - RPD	))		ICP		ICP-l			AA		AA-l	Нg
				·	Yes	No	NAY	es No	NA[	Yes N	lo N	A Yes	No	NA
8.1	batch, per matri		ction: If no, J(+), with prof	uency (one per 20 samples, per essional judgment, analytes no	11.00 2.5 2.0 3.0							X		
8.2	judgment. Not	e in worksheet. pike analysis may b	•	If yes, J(+) with professional		, , , , , , , , , , , , , , , , , , ,							X	
8.3		rol limit of 75-125%		centration, are spike recoveries to analytes with concentration %R < 30%			Š					X		
-	Positive Non-detect	J None	J UJ	J R				(E)						

Note:

Sample AA-P-10-42 was spiked and analyzed for metals, the MS recovery for potassium (136%) was outside evaluation criteria of 75-125% and RPD (22) was outside evaluation criteria of RPD < 20. Potassium was qualified estimated "J" in sample AA-P-10-42. MS/MSD recoveries for aluminum (136/21%), calcium (464/302%), iron (-63/-483%), magnesium (179/129%) and MS recovery for manganese (128%) in sample AA-P-10-42 were outside evaluation criteria of (75-125%). These analytes had sample results greater than 4X the spike concentration, therefore, no qualification of data was required.

Field ID	Analyte(s)	Qualifications	Code	Run#	Justification
AA-P-10-42	Potassium	J	m,d	680-47878	MS recovery high and RPD

9.0 Instrument Detection Limits (IDL)		ICP		ICI	P-MS		FAA	CVAA-H	g
	Yes	No	NAY	es l	No NA	Yes	No NA	Yes No	NA
9.1 Are all IDL equal to or less than the reporting limits specified?	<b>X</b>		25	7.4		20120		X	

Note:

10.0 ICP Seri	al Dilutions (Code s)		ICP		I(	CP-M	IS	(	JFA.	A	CV	AA-	Hg	
		Yes	No	NA	Yes	No	NA	Yes	No	NA	Yes	No	NA	
10.1	Were serial dilutions performed?	X		[	#£.									
10.2	Was a five-fold dilution performed?	*******												
10.3	Did the serial dilution results agree within 10% for analyte concentration $> 50$ x the IDL in th original sample? If no, $J(+)$ .	e X			18									

Note: Samples AA-P-10-42 and UAA-11-22 were diluted and analyzed, all %Ds were within QC limits.

1	1.0 Field Dup	licate Samples (Code f)		ICP	1 -	CP-MS	1	<b>JFAA</b>	CVA	0	
_			Yes	No NA	Yes	No NA	Yes	No N	A Yes N	o NA	
	11.1	Were any field duplicates submitted for metal analysis?	X		5,49		200		W.X		
	11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% difference < ± 2 x PQL and For solids, RPD < 50% or difference < ± 4 x PQL)	or <b>x</b> '						x		

Note: Samples UAA-11-62-D was a duplicate of UAA-11-62 and AA-P-10-102-D was a duplicate of AA-P-10-102, no qualification of data was required.

12.0 Result Ver	2.0 Result Verification (Code Q)			ICP ICP-MS			S	G	FAA		CVA	A-Hg
		Yes	No	NA Y	es	No 1	VA Y	-	No 1	NA Y	s N	o NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			X	<b>X</b> 33		Ţ.			35	(%)	X
12.2	Were all dilution reflected in the positive results and detection limits?	<b>X</b>		#2/c#			,	Mary 1		4.5		х

Note: All samples were aqueous and mercury results did not require a dilution.

## 13.0 Data Completeness

13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% for soil sample)				
13.2	Number of samples:	18	0	0	- 18
13.3	Number of target compounds in each analysis:	22	1 0		7 1
13.4	Number of results rejected and not reported:	0	1 0	7 0	
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$	100		]	
	% Completeness	100	] ###	<del>*</del>	<b>#</b> ] 100

Note:

25

# DATA VALIDATI. . WORKSHEET WET CHEMISTRY ANALYSIS

Reviewer:	Tony Sedlacek	Project Name:	Sauget - Area 2
Date:	8/2/2006	Project Number:	21561683.80011
Laboratory	Severn Trent Laboratory - Savannah	SDG No.:	SAS046
Test Name:	<del></del>	Review Level:	Level III
Method No.:	350.1		
Major Anomo	olies: No samples were rejected		

#### Minor Anomolies:

No samples were qualified in this SDG.

Field IDs:	OSAA-1-26	OSAA-1-106	TB-7	AA-P-10-62
	OSAA-1-46	UAA-11-22	UAA-11-82	TB-8
	OSAA-1-66	UAA-11-42	UAA-11-102	AA-P-10-82
	OSAA-1-86	UAA-11-62	AA-P-10-22	AA-P-10-102
	TB-6	UAA-11-62-D	AA-P-10-42	AA-P-10-102-D
				AA-P-10-118.5

#### 1.0 Chain of Custody/Sample Condition

			Yes	No	NA
	1.1	Do Chain-of-Custody forms list all samples analyzed?	X X		
	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X de		
	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
L		of samples, analytical problems or special circumstances affecting the quality of the data?	x	(1 to 1 to 1)	

Note: The laboratory case narrative indicated the matrix spike recovery for ammonia was outside of evaluation criteria.

## 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X	Ι	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		x	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		Har X Com	
Note:	Holding times were met.			

#### 5... Blanks (Method Blanks and Field Blanks) (Code x - Field Blank Contan.....tion, Code z - Method blank contamination)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?	SAX X		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?		NEW YORK	X
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			х

Note: Field/rinse/equipment blanks were not submitted as part of this SDG.

#### 4.0 Initial Calibration (Code c)

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	3 X		
4.2				
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.			X

Note: All initial calibration criteria were met.

### 5.0 Continuing Calibration (Code r)

 		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	X		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	( X		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X	
	If yes, a marginal increase in response $>20\%$ then J(+) only; a decrease in response then J(+)/ UJ(-). For $\%$ R < 50%, flag R.			
5.4	If Level IV, calculate a sample of %Rs.			X

Note: All continuing calibration criteria were met.

### 6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)\_

		Yes	No	NA.
6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	XCOL		
6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	X		
6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	622030	х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
H	other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			
	Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: MS recovery for ammonia (89%) in sample AA-P-10-42 was outside evaluation criteria of (90-110%). The LCS was within evaluation criteria, therefore no qualification of data was required.

#### 7.0 Laboratory Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD)

		Yes	NO NA
7.1	Is an LCS recovery form present?	<b>X</b>	
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	<b>** X **</b>	
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	<b>x</b>	
7.4	If Level IV, verify the % recoveries are calculated correctly.		X
	Action for specific compound outside the acceptance criteria: %R>UCL,		
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)		

Note: All LCS recoveries within evaluation criteria.

#### 8.0 Analyte Identification

		Yes	No	NA
8.1	Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the			
	standard RRT in the continuing calibration?			Х

Note:

#### 9.0 Analyte Quantitation and Reported Detection limits

		Yes No NA
9.1	Are RLs used consistent with those specified in the QAPP?	X
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	X X
9.4	If Level IV, calculate a sample of positive results to verify correct calculations	X

Note: RLs were adjusted to reflect dilutions.

#### 10.0 Field Duplicate Samples (Code f)

_			Yes	No	NA
Ī	10.1	Were any field duplicates submitted?	X		
	10.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	X		
		Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
1		qualitative assessment in the data validation report.			

Note: Sample UAA-11-62-D was a duplicate of UAA-11-62 and AA-P-10-102-D was a duplicate of AA-P-10-102 and all criteria were met.

#### 11.0 Laboratory Duplicates (Code k)

		Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with duplicate results.	x		
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		x	
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQL for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.			

Note: Sample OSAA-1-26 was duplicated by the laboratory and the RPDs were within criteria.

## Data Completeness

				Yes	No	NA
	12.1	12.1 Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% 12.2 Number of samples:		X		
	12.2					
	12.3	Number of target compounds in each analysis:	1			
	12.4	Number of results rejected and not reported:				
		% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
L	% Completeness 100					

Note:

SDG No: SAS047



# DATA VALIDATION WORKSHEET VOLATILE ORGANIC ANALYSIS

Reviewer: Tony Sedlacek

Date: 8/8/2006

Laboratory Severn Trent Laboratory - Savannah

 Project Name:
 Sauget - Area 2

 Project Number:
 21561683.80011

 SDG No.:
 SAS047

 Review Level:
 Level III

Major Anomolies:

No samples were rejected

**Minor Anomolies:** 

Sample SA2-MW-1-D were qualified due to ICAL  $r ^2 < 0.990$  and CCAL % D > 20%.

Field IDs:

SA2-MW-1-D

TB-9

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?		X S	

Note: The laboratory case narrative or cooler receipt did not indicate any problems.

## 2.0 Holding Time/ Preservation (Code H)

				·			Yes	No	NA
	2.1 Do sample preservation, collection and storage condition meet method requirement?					<b>X</b>			
		If sample preservatio	n and/or temperature v	vas inappropriate (i.e.,	<2° >6°C, etc.), comment in re	eport. If			
		unpreserved or tempe	s with a						
					itive detections "J" and non-de				
	2.2	Have any technical h J(+)/UJ(-).	olding times, determin	ned from sampling to da	nte of analysis, been exceeded	? If yes,		X	
		Matrix Aqueous	Preserved No	Aromatic 7 days	All others 14 days				
ļ		Soil/Sediment	Yes 4 <sup>o</sup> C ± 2 <sup>o</sup> C	14 days 14 days	14 days 14 days				
	2.3	Have any technical h	olding times been gro	ssly (twice the holding	time) exceeded? If yes, J(+)/I	R(-).		X	

Note: All holding times were met.

#### 3.0 GC/MS Instrument Performance Check (Code T)

		Yes	No	NA.
3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	X X		
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	7.75 X 2.5		
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	XXXX		

Note: All tuning criteria were met.

#### 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

			Yes	No	NA
Г	4.1	Is a Method Blank Summary form present for each batch?	X		
	4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?		X	
	4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?		<b>X</b>	
Г		Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride,			
ı		acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated		Ì	١
		to the RL for estimate (laboratory "J" flagged) concentrations.			'
	4.4	If Level IV, review raw data and verify all detections for blanks were reported.			х

Note: All blanks met criteria.

#### 5.0 GC/MS Initial Calibration (Code C)

 		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	S 200 B	X	
	If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	Do any SPCC compounds have an RRF less than specification or any other compounds $< 0.05$ (use 0.01 for poor responders like ketones or alcohols)? If yes, $J(+)/R(-)$ .	i	X	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	TAX X		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			Х

Note: Acetone (0.989) had an r ^ 2 value less than 0.990, and was qualified estimated nondetect "UJ".

			<u></u>		
Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-1-D	Acetone	UJ	С	680-49126	ICAL r ^ 2 < 0.990

#### 6.0 Continuing Calibration (Code C)

		Yes	No	NA.
6.1	Are Continuing Calibration Summary forms present and complete?	X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?		Х	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	L. X		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	x		
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
6.5	Do any compounds have an RRF $< 0.05$ (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X +	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			Х

Note:

A continuing calibration standard has not been analyzed every 12 hours, but all samples were analyzed within 12 hours of the standard being ran. Compounds 2-butanone (-29.6%), 1,1,1-trichloroethane (26.3%) and carbon tetrachloride (29.6%) had %D < 20%, and 2-butanone was qualified estimated nondetect "UJ". Compounds 1,1,1-trichloroethane and carbon tetrachloride were nondetect and did not require qualification.

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-1-D	2-butanone	UJ	С	680-49126	CCAL %D > 20%

#### 1.0 Surrogate Recovery (Code S)

					Yes	No	N A
7.1	Are all sampl	es listed on the ap	propriate Surrogate Recovery Su	ımmary Form ?	<b>x</b>		
7.2			acceptance criteria specified in		, X		
7.3	If No in Secti	on 7.2, were these	sample(s) or method blank(s) re	analyzed?			2
7.4	out.)	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted					;
	NI-4- IF CN (C	recoveries do no	t meet acceptance criteria in sam	ples chosen for the MS/MSE	or diluted		
	Note: It Sivic	Tecoveries do no	The state of the s		or arraced		
	Note: II SMC	> UCL	10% to LCL	< 10%	or unated		
	Positive				or unated		

Note: All surrogate recoveries within evaluation criteria.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	3 X - * ·		
8.2	per twenty for each matrix?			
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	X		
	Using informed professional judgment, the data reviewer should use the MS and MSD results in			
	conjunction with other QC criteria and determine the need for qualification of the data for samples from			
	the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: Sample SA2-MW-1-D was spiked and analyzed for VOCs, no qualification of data was required.

## 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA
9.1	Is an LCS recovery form present?	- X 7.		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	70 S X		
9.4	If Level IV, verify the % recoveries are calculated correctly.			Х
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			

Note: All LCS recoveries within evaluation criteria.

#### 10.0 Internal Standards (Code I)

•					Yes	No	NA
10.1	Are internal star	ndard areas for every sample	and blank within upper an	d lower QC limits?	Y X		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	Ĵ	J	J			
	Non-detect	None	UJ	· R			
Note:	The method spe	cification is for the continuin	g calibration to be compare	ed to the mid-point initial			
	calibration, not	sample to continuing calibrat	tion. Thus, if all other QC s	pecifications are met for a	given		1
	sample, using in	formed professional judgmen	nt, the reviewer may choose	e not to flag individual sam	ples in		
10.2	Are retention tir	nes of internal standards with	nin 30 seconds of the associ	ated calibration standard?	( X X		
	Action: The chi	romatogram must be examine	ed to determine if any false	positives or negatives exist	. For		
	shift of a large n	nagnitude, the reviewer may	consider partial or total reje	ection of the data for non-de	etects ·		
	in that sample/fr	raction.					

Note: All internal standard area counts and retention times within evaluation criteria.

#### 11.0 TCL Identification (Code W)

_			Yes	No	NA J
	11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X. Ye		
	11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	X		
_	Note:	All criteria was met.			

12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	X		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	Garage X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X (Z)		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	X	N. COM	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note: Chlorobenzene in sample SA2-MW-1-D exceeded the linear range of the instrument and the sample was diluted 1:10 and the diluted result was within the calibration range of the instrument.

## 13.0 Field Duplicate Samples (Code F)

_		<u> </u>	Yes	No	NA.
	13.1	Were any field duplicates submitted for VOC analysis?	306	х	
	13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	a la maria de la compania del compania del compania de la compania del la compania de la compani		x
		Action: No qualifying action is taken based on field duplicate results, however the data validator should			
		provide a qualitative assessment in the data validation report.			<u> </u>

Note: Field duplicates were not submitted for VOC analysis.

## 14.0 Data Completeness

				Yes	No	NA .
	14.1	Is % completeness within the control limits? (Control limit: Check QA	PP or use 95% for aqueous	X		
	14.2	Number of samples:	2			
	14.3	Number of target compounds in each analysis:	34			
	14.4	Number of results rejected and not reported:	0			
		% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$				
L		% Completeness	100			

Note:

## DATA VALIDATIC WORKSHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer:	Tony Sedlacek	Project Name:	Sauget Area 2 Supp. Investigation
Date:	8/9/2006	Project Number:	21561683.80011
Laboratory	Severn Trent Laboratory - Savannah	SDG No.:	SAS047
		Review Level:	Level III
Major Anomo	olies:		
	Compound 3,3'-Dichlorobenzidine was re	jected in sample SA2-MW-1-D for low LCS recovery.	•
Minor Anome	olies:		
	Compound 3-Nitroaniline was qualified	ue to low LCS recovery.	

Field IDs: SA2-MW-1-D

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	( <b>X</b>		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X.		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
<b> </b>	of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. The LCS recoveries were outside evaluation criteria for 3-nitroaniline and 3,3'-dichlorobenzidine.

## 2.0 Holding Time/ Preservation (Code H)

	Yes	No	NA
Do sample preservation, collection and storage condition meet method requirement?	X		
If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached		X	
Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		X	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Extraction: Soil/Sediment 14 days - aqueous 7 days  Analysis: 40 days	Do sample preservation, collection and storage condition meet method requirement?  If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days	Do sample preservation, collection and storage condition meet method requirement?  If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days

Note: All holding times were met.

#### 3.0 GC/MS Instrument Performance Check (Code T)

		Yes No	NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	<b>X</b>	
3.2	Have all samples been analyzed within twelve hours of the tune?	(\$\forall \bar{\bar{\bar{\bar{\bar{\bar{\bar{	
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".		
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	- X	
	If no, all standards, blanks, field samples and QC samples are rejected "R".		

Note: All tuning criteria were met.

#### 4.0 . s (Method Blanks and Field Blanks) (Code X - Field Blank Contamina ..., Code Z - Method blank contamination)

		Yes	No	NA NA
4.1	Is a Method Blank Summary form present for each batch?	<b>X</b> (2)		
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?		NEX X	
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?		What is a	x
	Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be qualified "U" and the detection limit elevated to the RL for estimate concentrations.			
4.4	If Level IV, review raw data and verify all detections for blanks were reported.			<u>x</u>

Note: Field equipment blanks were not submitted for analysis.

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?		365 X	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			X
5.3	Do any SPCC compounds have an RRF les than specification or any other compounds $< 0.05$ (use 0.01 for poor responders like amines and phenols)? If yes, $J(+)/R(-)$ .		x	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X - x -		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations and initial calibration verifications. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. All initial calibration met criteria.

#### 6.0 Continuing Calibration (Code C)

		Yes	I_NO_	NA.
6.1	Are Continuing Calibration Summary forms present and complete?	) X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	图 分别	X	
6,3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	35.50	X	
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	X	750	
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
6.5	Do any compounds have an RRF $< 0.05$ (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X X	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			X

A continuing calibration standard was not analyzed every 12 hours, although the samples were analyzed within 12 hours of the standards being ran. The laboratory case narrative indicated that the grand mean exception was applied to the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation, no qualification of

Note:

#### 7.0 Sgate Recovery (Code S)

		_		·		Yes	No	NA NA
7.1	Are all sampl	es listed on the ap	propriate Surrogate Recovery S	Summary Form ?		X X		
7.2	Are surrogate	recoveries within	acceptance criteria specified in	the QAPP for all samples ar	nd method blanks?	X		
7.3	Are more than	one of either frac	tion outside the acceptance crite	eria?			X	
7.4	If Yes in Secti	on 7.3, are these s	ample(s) or method blank(s) re	analyzed?				х
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?						x	
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.							
		> UCL	10% to LCL	< 10%				
	Positive	J	J	J				
	Non-detect	None	UJ	R				

Note: All surrogates met criteria.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	3707	х	
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	3000000		X
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?			X
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same			
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: MS/MSD samples were not submitted for SVOC analysis.

## 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	INO	NA NA
9.1	Is an LCS recovery form present?	X		
9.2	Is LCS analyzed at the required frequency for each matrix?	** <b>X</b>		
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?	57.14	х	
	Action for specific compound outside the acceptance criteria: $R>UCL$ , $J(+)$ only; $LCL$ , $J(+)/UJ(-)$ ; $U(-)$ ; $U(-)$ , $U(-)$ ; $U(-)$ , $U(-)$ ; $U(-$			
9.4	If Level IV, verify the % recoveries are calculated correctly.			X

Note:

LCS recoveries for 3-Nitroaniline (35%) was outside evaluation criteria of (46-114%) and 3,3'-Dichlorobenzidine (5%) was outside evaluation criteria of (29-101%). 3-Nitroaniline was nondetect and qualified estimated nondetect "UJ" in sample SA2-MW-1-D and 3,3'-Dichlorobenzidine was nondetect and qualified rejected "R" in sample SA2-MW-1-D.

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-1-D	3-Nitroaniline	UJ	L	580-4971	LCS recovery low
SA2-MW-1-D	3,3'-Dichlorobenzidine	R	L	580-49711	LCS recovery < 10%

## 10.0 ....ernal Standards (Code I)

					Yes	No	NA .
10.1	Are internal stan	dard area of every sample ar	nd blank within upper and lo	ower QC limits for each contin	nuing 🗀 🗴 💎		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
Note:	The method spec	ification is for the continuin	g calibration to be compared	d to the mid-point initial calib	ration, not		
	sample to continu	uing calibration. Thus, if all	other QC specifications are	met for a given sample, using	,		
	informed profess	ional judgment, the reviewer	may choose not to flag ind	ividual samples in this case.			
10.2	Are retention tim	es of internal standards with	in 30 seconds of the associa	ted calibration standard?	X X X		
	Action: The chro	omatogram must be examine	d to determine if any false p	ositives or negatives exist. For	or shift of		
	a large magnitud	e, the reviewer may consider	partial or total rejection of	the data for non-detects in tha	t	İ	
	sample/fraction.						

Note: All internal standard areas were within criteria.

## 11.0 TCL Identification (Code W)

		Yes	No	NA NA
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X A		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	gs Xics		

Note:

## 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	2005X9403		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	100		X
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	x X		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

Note: Samples analyzed did not require a dilution.

## 13.6 Ad Duplicate Samples (Code F)

		Yes	No	NA NA
13.1	Were any field duplicates submitted for SVOC analysis?	West Const	х	
13.2	Were all RPD or absolute difference values within the control limits?			X
	No action is taken based on field duplicate results, however the data validator should provide a qualitative			
	assessment in the data validation report.			

Note: Field duplicates were not submitted for SVOC analysis.

## 14.0 Data Completeness

				Yes	No	NA NA
14	4.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample, 90%	X		
		for soil sample)				
14	1.2	Number of samples:	1			
14	4.3	Number of target compounds in each analysis:	65			
14	4.4	Number of results rejected and not reported:	1			
1	_	% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
		% Completeness	98.46153846			

Note: Compound 3,3'-Dichlorobenzidine was rejected in sample SA2-MW-1-D for low LCS recovery.

#### DATA VALIDATIG. WORKSHEET HERBICIDES ANALYSIS

Reviewer: Tony Sedlacek	Project Name:	Sauget - Area 2
Date: 8/9/2006	Project Number:	21561683.80011
Laboratory Severn Trent Laboratory - Savannah	SDG No.:	SAS047
· · · · · · · · · · · · · · · · · · ·	Review Level:	Level III
Major Anomolies:		
No samples were rejected		

Minor Anomolies:

No samples required qualification in this SDG.

Field IDs: SA2-MW-1-D

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA_
1.1	Do Chain-of-Custody forms list all samples analyzed?	Y X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	, X.,		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition			
	of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated the grand mean was applied to continuing calibration verification standards. This rule is described in Method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all compounds in the CCV is less than or equal to 15%. The LCSD recoveries were outside

#### 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	7X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		×X	
[	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days	T		
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).		X	

All holding times were met. Note:

### 3.0 Blanks (Method Blanks and Field Blanks) (Code x - Field Blank Contamination, Code z - Method blank contamination)

			Yes	No	NA
	3.1	Is a Method Blank Summary form present for each batch?	<b>X</b> ***		
L	3.2	Do any method blanks have positive results?		# 42 X (***)	
	3.3	Do any field/rinse/equipment blanks have positive results?		是以外河	Х
		Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be			
į		elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
	3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

All Method blanks met criteria and field/rinse/equipment blanks were not submitted for analysis. Note:

#### 4.0 Initial Calibration (Code r)

		Yes	No	NA_
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	75 X		
4.2	Are calibration factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument	X		
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: All initial calibration met criteria.

#### 5.0 Continuing Calibration (Code c)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	X X		
5.2	Has a continuing calibration standard been analyzed every 12 hours?		x	
5.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 20%)?		X	
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
5,5	If Level IV, calculate a sample of CFs and %Ds from ave CF to verify correct calculations.			X

Note:

A continuing calibration standard was not analyze every 12 hours, although all samples were analyzed within 12 hours of the standard being ran. The grand mean was applied to continuing calibration verification standards. This rule is described in Method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all compounds in the CCV is less than or equal to 15%.

#### 6.0 Surrogate Recovery (Code s)

					Yes	No	NA
6.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?		X				
6.2	Are surrogate re	coveries within	acceptance criteria specified in	the QAPP for all samples?	<b>X</b>		
6.3	If No in Section	6.2, were these	sample(s) or method blank(s) r	eanalyzed?			X
6.4	If No in Section	6.3, is any sam	ple dilution factor greater than	0? (Surrogate recoveries may be diluted out.)			X
		> UCL	10% to LCL	< 10%		,	
	Positive	J	J	J			
	Non-detect	None	UJ	R			

Note: All surrogate recoveries met evaluation criteria.

#### 7.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	(4)(4)(4)(4)	Х	
7.2				
	for each matrix?	100		X
7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	\$40 Desiral		X
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
	other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			1
	Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			
Mada	A MCMCD			

Note: An MS/MSD was not submitted for herbicide analysis.

#### Laboratory Control Sample (LCS/LCSD) (Code 1 - LCS recovery Coo. RPD)

	·	Yes	No	NA
8.1	Is an LCS recovery form present?	X		
8.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
8.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?		X	
8.4	If Level IV, verify the % recoveries are calculated correctly.			х
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" $(+$ only)			

Note:

The LCSD recovery for Dichlorprop (109%) was outside evaluation criteria of (43-106%) and LCSD recovery for MCPP (152%) was outside evaluation criteria of (27-150%). The LCS recoveries and RPDs were within evaluation criteria for both analytes, therefore, no qualification of

#### 9.0 TCL Identification (Code w)

		Yes	No	NA
9.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the			
	continuing calibration?	X		

Note:

#### 10.0 TCL Quantitation and Reported Detection limits (Code p)

		Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?	X		
10.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	100		х
10.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
10.4	If Level IV, calculate a sample of positive results to verify correct calculations			X

Samples analyzed did not require a dilution. Note:

11.0 Field D	11.0 Field Duplicate Samples (Code f)		No	NA.
11.1	Were any field duplicates submitted for herbicide analysis?	- 4.02.0	X	
11.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	1.00		X
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
	qualitative assessment in the data validation report.			

Note: Field duplicates were not submitted for herbicide analysis.

#### 12.0 Data Completeness

			Yes	No	NA.
12.1	Is % completeness within the control limits? (Control limit: Check Q	APP or use 95% for aqueous sample, 90%	XXXX		
12.2	Number of samples:	1	1		
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	100			

Note: All data was usable.

# DATA VALIDATION WORKS Inorganic - ICP, ICP-MS

ET - Level III Review AA, and CVAA

Reviewer: Date:	Tony Sedlacek 8/9/2006				roject ect N			Sau 21			a 2 30011		
Laboratory						OG N			S047				
	Development of the second of t			R	eview				vel II				
Major Anomo	lies: No samples were rejected						,				<u> </u>		
Minor Anomo	lies: Samples required qualification due to sample results less than 5X the blank result and ser	ial di	lutio	n %l	D > 10	0%.							
Field IDs:	SA2-MW-1-D										~		
1.0 Chain of C	Custody/Sample Condition/Raw Data		ICP		IC	P-N	1S	C	FAA	T	CV	AA-I	Ig
								Yes	No	NA	Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	C X			1000			<b>9</b> 5553	Ť		X.		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintain	X			Mag.			₹ <u>₹</u> `\$			X.		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances										TO COMPANY	-	
	affecting the quality of the data?	x	865						3.00 3.00 3.00 3.00 3.00 3.00 3.00 3.00		8	X	
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: $4^{\circ}C \pm 2^{\circ}C$ )	ZX.								10.5 cm 20.0 cm	X		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	ELECT.								1	X X		
Note:	The laboratory case narrative indicated that sodium was analyzed at a dilution in sample S digestion spike due to a high level of target analytes. The serial dilution was outside contractions and the serial dilution was outside contractions.												ost-
2.0 Holding T			ICP			P-N			FAA			AA-I	
		Yes	No	NA	Yes	No	NA	Yes	No	NA]	Yes	No	NA
2.1	been exceeded? (Hg: 28days, other metals: 6 months) See attached Holding Time Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time		X								W. C. C. C. C. C. C. C. C. C. C. C. C. C.	x	
Note	criteria   J(+)/R(-).				<u> </u>	<b>200</b>	<u> </u>	<u> </u>	777			100	
Note:	All samples met holding time criteria.												

3.0 I vn	nent Calibration (Code c)	<u> </u>	ICP	IC	P-MS	GF	AA CVAA-	Hg
		Yes	No NA	Yes	No NA	Yes N	lo NA Yes No	NA
3.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	X			2. 2.		, x	
3.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).				200			х
3.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	7 763	81 I				X	
3.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.		A Victorial Control of the Control o		A SOCIETY AL. SERVICES			
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits?  Mercury (80%-120%) and other Metals (90%-110%).  Action: R(+/-) J(+)/UJ(-) J(+) R(+)  Mercury <65% 65% - 79% 121% - 135% > 135%  Other Metals <75% 75% - 89% 111% - 125% > 125%	X	The state of the s		ACTION AND COMPANY OF THE ACTION AND COMPANY		×	

Note: Instrument calibration for CVAA was not listed as correlation coefficients, it was listed as %R and all %Rs were within evaluation criteria.

## 4.0 Blanks (Code o - Calibration blank failure, Code p - Preparation blank failure, Code x - Field blank failure)

			ICF			CP-M			AA		AA-I	-Ig
		Yes	No	NA	Yes	No	NA	Yes 1	IO NA	Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X			K 54		1			X		
4.2	Are there reported PB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		X						19. J.		x	
4.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	X	4				20 400			X.		
4.4	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data to note in reviewer narrative.	13.00	P. V. C. Control				200			X		
4.5	Are there reported ICB or CCB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x									X	
4.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	x		1				i i			ing.	
4.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).	х									x	

Note:

Analytes chromium (.0042 mg/L) and copper (.0034 mg/L) results were less than 5 times the continuing calibration blank values and were qualified "U" in sample SA2-MW-1-D. The lead (.0050 mg/L) result was less than 5 times the most negative value in the continuing calibration blank and qualified "UJ" in sample SA2-MW-1-D.

Field ID	Analyte(s)	Qualification	Run #	Justification
SA2-MW-1-D	Chromium	U	680-50308	mple results < 5x blank resi
SA2-MW-1-D	Copper	Ŭ	680-50308	mple results < 5x blank res
SA2-MW-1-D	Lead	UJ	680-50308	mple results < 5x blank res

5.0 IC	terference Che	ck Sample (IC	CS) (Code n)					ICP	<u> </u>		-MS		<b>GFAA</b>		VAA-	Hg
							Yes	No	ÑΑ	Yes 1	No NA	Yes	No N	A Yes	No	NA_
5.1	Was ICS A	B analyzed at	beginning of ea	ch ICP run (or at	t least twice every e frequent) for ICP	8 hours), and -MS?	X									
5.2	Are the IC	S AB recoverie	es within 80% -	120%?			X.									
5.3				(CSA) < + IDL?			NAME OF THE OWNER, OF THE OWNER, OF THE OWNER, OF THE OWNER, OWNE									
5.4	If not, are the ICS?	the associated	sample Al, Ca,	Fe, and Mg cond	centrations less tha	n the level in		x								
	Action:	Not Spike	ed Analytes	Spiked	I analytes (ICS AB	analytes)				W.J.						
		< -IDL	> IDL	< 50%	50% - 79%	> 120%										
		UJ(-)	J(+)	R(+/-)	J(+)/UJ(-)	J(+)	200			2005						

Note:

Unspiked analytes cadmium (.0025 mg/L), chromium (.0018 mg/L), copper (.0019 mg/L), manganese (.0060 mg/L) and zinc (.0138 mg/L) had results in ICS A < IDL. Chromium and copper were previously qualified due to blank contamination, therefore no further qualification is required. The unspiked results in ICS A had little affect on the sample results for manganese (15 mg/L) and zinc (34mg/L) in sample SA2-MW-1-D due to the level of target analyte, therefore no qualification of data was required. The cadmium result in sample SA2-MW-1-D was already qualified "J",

_abora	tory Control Sample (LCS) (Code I - R	ecovery, Code e - RPD)				ICP	1	P-MS		FAA	CVAA-	
					Yes	No N	IA Yes	No N	IA Yes	No NA	A Yes No	N
6.1	Was an LCS prepared and analyzed batch, per matrix and per level)? At LCS results.				X						X	
6.2	Is any LCS recovery outside the cont Ag and Sb; Solid limits: as per EPA-E		nits: 80% - 1	20% - except		Xv					x*	
	Action: Solid	Ac	queous							,		
	< LCL > UCL	< 50% 50%	6 - 79%	> 120%	ł			W		100 m	1	
	J(+)/UJ(-) J(+)	R(+/-) J(+	)/UJ(-)	J(+)	T	X350		\$49£		100	5/36/2	

Note: All recoveries met evaluation criteria.

7.0 Laborat	ory Duplicates (Code k)		ICP		IC	P-MS	1 (	ĴFAA	CVAA-	Hg
		Yes	No	NA	Yes	No N	A Yes	No N	IA Yes No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.			x						x
7.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			x						x
7.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQL for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+).			x						x
	Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	1000			60 A		27.		1442	

Note: The laboratory did not duplicate any samples that were part of this SDG, the samples duplicated were from another client.

3.0 S <sup>2</sup> Sa	mple Analysis -Pre-Digestion (Code m - Recovery, Code d - RPD)		ICP			CP-MS		βFAA		AA-H	<del>~</del>
	· · · · · · · · · · · · · · · · · · ·	Yes	No	NA	Yes	NoNA	Yes	Noll	IA Yes	No	NA
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per samples, per batch, per matrix and per level)? Action: If no, J(+), with profession judgment, analytes not associated with matrix spike results.	122523055	1 A Part of the Pa	x			an i				x
8.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with profession judgment. Note in worksheet.	al		x							x
<u> </u>	Note: Matrix spike analysis may be performed on a field blank when it is the on aqueous sample in an SDG.	ly									
8.3	For all analytes with sample concentration $< 4 \times 10^{-5}$ x spike concentration, are spirecoveries within the control limit of 75-125%? (No control limit applies to analytic with concentration $> 4 \times 10^{-5}$ x spike concentration.)	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	36 L	x		1 m 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					x
	%R > 125% 30% < %R < 74% %R < 30%		Š		200		W 188		53.50		
	Positive J J J	156	2 2		32		A.A.		<b>*</b>		
	Non-detect None UJ R	1.00	ž.					IT			

Samples spiked analyzed were from another client. Note:

.o Instrument Detection Linus (IDL)	1	ICF.	1 10	L-MID		JI'AA	L C V	777	<u> </u>	
	Yes	No NA	Yes	No N	Yes	NoN	A Yes	No	NA	
9.1 Are all IDL equal to or less than the reporting limits specified?	X.		225		1300		X			Į

Note:

10.0	ICP	Serial	<b>Dilutions</b>	(Code s)
------	-----	--------	------------------	----------

10	.0 ICP Ser	rial Dilutions (Code s)		IC	СP	T		CP-N			GFA.			AA-I	
			Yes	s N	lo l	VA	Yes	No	NA	Yes	No	NA	Yes	No	NA
	10.1	Were serial dilutions performed?	≫ X	200	П		<b>ж</b> Д,				L				
	10.2	Was a five-fold dilution performed?	X	<i>Ş</i>											
$\Gamma$	10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDI		55											
		in the original sample? If no, J(+).		12	x L					1	ļ.,_				

Note:

Sample SA2-MW-1-D was diluted and analyzed, and potassium (13.5%) was outside evaluation criteria of < 10%. Potassium was qualified estimated "J" in sample SA2-MW-1-D.

Field ID	Analyte(s)	Qualification	Run #	Justification
SA2-MW-1-D	Potassium ,	J	680-50308	serial dilution result %D >10%

11.0 Field Duplicate Samples (Code 1)			ICP	·		CP-MS	<del></del>		<u>v a a -</u>	
		Yes	No	NA	Yes	No NA	Yes	No NA Yes	No	_NA
11.1	Were any field duplicates submitted for metal analysis?		X	Γ	海色		1,200	226	X	
11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% or difference < ± 2 x PQL and For solids, RPD < 50% or difference < ± 4 x PQL)			x						x

Note:

Field duplicates were not submitted for metals analysis.

12.0 P ult	12.0 P - ult Verification (Code Q)		ICP		CP-MS   GFAA   CVAA				A-Hg	
		Yes	Nol	IA Yes	No NA	Yes	No N	A Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?			x		**				x_
12.2	Were all dilution reflected in the positive results and detection limits?	X.						(£13)		х
Note:	The matrix of samples analyzed was aqueous, no samples submitted were solid-matrix.									

## 13.0 Data Completeness

13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% for soil sample)			_	
13.2	Number of samples:	1	0	101	1 1
13.3	Number of target compounds in each analysis:	22	0	0	1
13.4	Number of results rejected and not reported:	0	0	0	0
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$				
	% Completeness	100	###	###	100

Note: All data was usable.

5/9/2007

#### DATA VALIDATIO: NORKSHEET WET CHEMISTRY ANALYSIS

Reviewer:	
-----------	--

Date:

Tony Sedlacek

8/9/2006

Project Name: Sauget - Area 2 Supp. Invest.

Project Number:

21561683.80011

SDG No.: Review Level:

SAS047 Level III

Test Name: Dissolved Gasses, chloride, ammonia, nitrate/nitrite, sulfate, Total

Method No.: RSK 175, 325.2, 353.3, 375.4, 415.1, 310.1

Laboratory Severn Trent Laboratory - Savannah

Major Anomolies:

Nitrate and nitrite were qualified rejected "R" due to being analyzed outside of holding time.

Minor Anomolies:

No samples were qualified in this SDG.

Field IDs:

SA2-MW-1-D

#### 1.0 Chain of Custody/Sample Condition

			Yes	No	NA
	1.1	Do Chain-of-Custody forms list all samples analyzed?	* <b>X</b>		
I	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	<b>X X</b>		
	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition		37.	
		of samples, analytical problems or special circumstances affecting the quality of the data?		X	

Note:

The laboratory case narrative indicated the methane results exceeded the upper calibration range of the flame ionization detector in sample SA2-MW-1-D so the results were reported from the thermal conductivity detector. Nitrite was analyzed outside of holding time, due to analyst error.

## 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	V X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
	was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached			
	Holding Time Table for sample holding time) If yes, J(+)/UJ(-).	x	11.0	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .	Х	* 3.75 AP	

Note:

Nitrite was analyzed outside holding time by approximately 8 days. The laboratory case narrative failed to mention that nitrate was also analyzed outside of holding time by approximately 8 days. The results were both nondetect and nitrate was qualified estimated nondetect "UJ" and nitrite was qualified rejected R in sample SA2-MW-1-D.

Field ID	Analyte(s)	Qualification	C∢	Run #	Justification
SA2-MW-1-D	Nitrate	UJ		680-50014	analyzed outside hold time
SA2-MW-1-D	Nitrite	R		680-50014	analyzed outside hold time

## 3. Janks (Method Blanks and Field Blanks) (Code x - Field Blank Contam....tion, Code z - Method blank contamination)

		Yes_	No	NA
3.1	Is a Method Blank Summary form present for each batch?		X	
3.2	Do any method blanks have positive results?		<b>X X 2.13</b>	
3.3	Do any field/rinse/equipment blanks have positive results?		18 A. A.	X
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: There was not a method blank associated with batch 680-49626. Field/rinse/equipment blanks were not submitted for analysis.

## 4.0 Initial Calibration (Code c)

		Yes No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	X X X X	
4.2	Are correlation coefficients stable (>0.995) over the concentration range of the instrument?	<b>X X</b>	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".		
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.		Х

Note: All initial calibration were within evaluation criteria.

## 5.0 Continuing Calibration (Code r)

 		Yes	No	NA.
5.1	Are Continuing Calibration Summary forms present and complete?	1 X		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	X		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X	
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %R < 50%, flag R.			
5,4	If Level IV, calculate a sample of %Rs.			X

Note: All continuing calibrations were within evaluation criteria.

## 6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

 		Yes	No	NA NA
 6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	SH # 100	X	
6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?			x
6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	专案 化黄疸		х
_	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
	other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			
	Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: MS/MSD samples were not submitted for analysis.

## Laboratory Control Sample (LCS/LCSD) (Code 1 - LCS recovery Code APD)

		Yes No	) NA
7.1	Is an LCS recovery form present?	X Yes	
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X-7	
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	(1.5 X 3.2)	
7.4	If Level IV, verify the % recoveries are calculated correctly.		х
	Action for specific compound outside the acceptance criteria: %R>UCL,		
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<30%$ $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)		

Note: All LCS recoveries within evaluation criteria.

## 8.0 Analyte Identification

_			Yes	No	NA.
	8.1	Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the			
I		standard RRT in the continuing calibration?	X		

Note:

## 9.0 Analyte Quantitation and Reported Detection limits

		Yes	No	NA
9.1	Are RLs used consistent with those specified in the QAPP?	(2) X*		
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	100 CAN	х	
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	Х		
9.4	If Level IV, calculate a sample of positive results to verify correct calculations			Х
Note:	The methane results exceeded the upper calibration range of the FID detector in sample SA2-MW-1-D so	the results were re	ported fro	m the TCD

The methane results exceeded the upper calibration range of the FID detector in sample SA2-MW-1-D so the results were reported from the TCD detector.

## 10.0 Field Duplicate Samples (Code f)

		Yes	No	NA NA
10.1	Were any field duplicates submitted?	<b>设施养验</b>	X	
10.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	4242		Х
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
	qualitative assessment in the data validation report.			_

Note: Field duplicates were not submitted for analysis.

## Laboratory Duplicates (Code k)

		Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with duplicate results.		X	
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.			x
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± PQL for aqueous, and RPD < 35% or difference < ± 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.	1 3 9 2 W W. 18 18 18 18 18 18 18 18 18 18 18 18 18		X

Note: The laboratory did not duplicate any samples for analysis.

## 12.0 Data Completeness

				Yes	No	NA
	12.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample, 90%	22.4	х	
	12.2	Number of samples:	1			
E	12.3	Number of target compounds in each analysis:	10			
	12.4	Number of results rejected and not reported:	2			
$\int_{0}^{\infty}$		% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				,
L		% Completeness	80			

Note: Data was rejected due to holding time violation.

SDG No: SAS048



## DATA VALIDAT. . WORKSHEET VOLATILE ORGANIC ANALYSIS

Reviewer:	Steve Gragert	Project Name:	Sauget - Area 2
Date:	8/22/2006	Project Number:	21561683.80011
Laboratory Se	evern Trent Laboratory - Savannah	SDG No.:	SAS048
· · ·		Daview Levels	Lovel IV

## Major Anomalies:

No samples were rejected

#### Minor Anomalies:

Analytes were qualified J/UJ due to CCAL %Ds > 20%.

Field IDs:	SA2-MW-4-D	SA2-MW-1-M	SA2-MW-1-M-D
	SA2-MW-1-S	TB-10	SA2-MW-2-M
	TD 11	CALANDALA	TD 10

TB-11 SA2-MW-2-D TB-12 SA2-MW-2-S SA2-MW-8-D SA2-MW-4-M SA2-MW-4-S SA2-MW-3M-FB SA2-MW-10M-FB

SA2-MW-3-FB SA2-MW-10M-F SA2-MW-3-M SA2-MW-3-S-D SA2-MW-3-D SA2-MW-10M SA2-MW-10D

SA2-MW-10-S

## 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	€ X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated an LCS RPD outside of evaluation criteria for Bromomethane and MS/MSD recoveries outside of evaluation criteria for Chlorobenzene and Bromomethane.

## 2.0 Holding Time/ Preservation (Code H)

						Yes	No	NA
2.1	Do sample preservat	ion, collection and stor	age condition meet me	ethod requirement?	200	<b>X</b> ( )	· · · · · · · · · · · · · · · · · · ·	
	If sample preservation	on and/or temperature v	vas inappropriate (i.e.,	<2° >6°C, etc.), comment in re	ort. If			
	unpreserved or temp	erature is outside the ra	ange 0° (but not frozen	) to 10° flag all positive results	with a			
	"J" and all non-detec	ts "UJ". If temperature	e exceeds 10°, flag pos	itive detections "J" and non-det	ects			
2.2				ate of analysis, been exceeded?			4-2-2-17	
	J(+)/UJ(-).					1	X	
	Matrix	Preserved	Aromatic	All others				
	Aqueous	No	7 days	14 days				
		Yes	14 days	14 days				
	Soil/Sediment	$4^{\circ}C \pm 2^{\circ}C$	14 days	14 days				
2.3	Have any technical h	nolding times been gros	ssly (twice the holding	time) exceeded? If yes, J(+)/R	(-).		ZL X E	

Note:

All holding times were met.

## 3.0 GC/MS Instrument Performance Check (Code T)

		Yes	No	NA
	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	5 X		
3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	X X		
3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	1.2 X		

Note: All tuning criteria were met.

## 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	X		
4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?		X	
4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?	X	200 P. 1984	
	Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride, acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
4.4	If Level IV, review raw data and verify all detections for blanks were reported.	x		

Note:

Trip blanks TB-10, TB-11 and TB-12 had positive results for toluene (0.87J, 0.68J and 1.1). All samples associated with these trip blanks were either non-detect for toluene or greater than 5X the associated blank contamination, therefore, no qualification of data was required. The review of chromatograms indicates all peaks present were accounted or the concentrations reported were below the method detection

## 5.0 GC/MS Initial Calibration (Code C)

			Yes	No [	NA
	5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X X		
	5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	X		
		If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
	5.3	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01			
		for poor responders like ketones or alcohols)? If yes, $J(+)/R(-)$ .		X	
	5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	% * <b>X</b>		
	5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	X		

Note:

Initial calibration was within evaluation criteria. Recalculations of the RRFs and %RSD were performed, and no errors in calculation were noted.

## Continuing Calibration (Code C)

	•	Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	X-X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	1500	Х	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	X		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial			
	and continuing calibration RRF outside QC limits (%D < 20%)?	x	194	
	If yes, a marginal increase in response $\geq 20\%$ then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For			
	%D > 50%, flag R.			
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.	Х		

Note:

A continuing calibration standard was not analyzed every 12 hours, although all samples were analyzed within 12 hours after a standard was analyzed. The CCV analyzed on 7/11/2006, AQ760, had 2-Butanone %D of -21.3%, all associated data were nondetect. The CCV analyzed on 7/12/2006, AQ768, had the following analytes %D>20%: Bromomethane (-21.7%), Carbon disulfide (20.5%), 2-Butanone (-21.0%), and 4-Methyl-2-Pentanone (-20.2%). The CCV analyzed on 7/13/2006, AQ776, had the following analytes %D>20%: Bromomethane (31.2%), 2-Butanone (-22.6%), 4-Methyl-2-pentanone (-25.2%). The following table indicates qualifiers based on CCV %D>20%. Recalculations of the RF and %D for one compound per standard were completed, and no errors in calculation were noted.

<u> </u>					
	Analyte(s)	Qualification	್ಟ್ಲ್ಸ್ _code	Run#	
SA2-MW-4-D	2-Butanone	<u>U</u> J	C	680-18156	CCAL %D > 20%
SA2-MW-1-M	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-1-M-D	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-1-S	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-2-M	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-2-D	Bromomethane	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-2-D	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-2-D	4-Methyl-2-Pentanone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-2-S	Bromomethane	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-2-S	2-Butanone	ÚJ	С	680-18156	CCAL %D > 20%
SA2-MW-2-S	4-Methyl-2-Pentanone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-8-D	Bromomethane	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-8-D	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-8-D	4-Methyl-2-Pentanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-M	Bromomethane	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-M	2-Butanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-M	4-Methyl-2-Pentanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-S	2-Butnaone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-S	4-Methyl-2-Pentanone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-4-S	Bromomethane	ŪJ	С	680-18156	CCAL %D > 20%
SA2-MW-3-M	2-Butnaone	UJ	С	680-18156	CCAL %D > 20%
SA2-MW-3-M	4-Methyl-2-Pentanone	ÚJ	С	680-18156	CCAL %D > 20%
SA2-MW-3-M	Bromomethane	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S	2-Butnaone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S	4-Methyl-2-Pentanone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S	Bromomethane	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S-D	2-Butnaone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S-D	4-Methyl-2-Pentanone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-S-D	Bromomethane	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-D	2-Butnaone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-D	4-Methyl-2-Pentanone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-3-D	Bromomethane	UJ	Ċ	680-18156	CCAL %D > 20%
SA2-MW-10M	2-Butnaone	ŪJ	C	680-18156	CCAL %D > 20%
SA2-MW-10M	4-Methyl-2-Pentanone	UJ	Č	680-18156	CCAL %D > 20%
SA2-MW-10M	Bromomethane	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-10D	2-Butnaone	UJ	C	680-18156	CCAL %D > 20%
SA2-MW-10D	4-Methyl-2-Pentanone	ÜJ	C	680-18156	CCAL %D > 20%
SA2-MW-10D	Bromomethane	UJ UJ	C	680-18156	CCAL %D > 20%
SA2-MW-10S	2-Butanone	ÜJ	C	680-18156	CCAL %D > 20%
SA2-MW-10S	4-Methyl-2-Pentanone	UJ	Č	680-18156	CCAL %D > 20%

## 7.0 Surrogate Recovery (Code S)

				<u>-</u>		Yes	No	NA
7.1	Are all sampl	es listed on the ap	propriate Surrogate Recovery S	ummary Form ?		· X		
7.2	Are surrogate	recoveries within	acceptance criteria specified in	the QAPP for all samples?		X		
7.3	If No in Secti	on 7.2, were these	sample(s) or method blank(s) re	eanalyzed?				
7.4	If No in Secti	on 7.3, is any sam	ple dilution factor greater than 1	0? (Surrogate recoveries m	nay be diluted			
	Note: If SMO	C recoveries do not	meet acceptance criteria in sam	ples chosen for the MS/MS	D or diluted			
	samples, then	no reanalysis is re	quired.			11		
1	-	> UCL	10% to LCL	< 10%				
	Positive	J	J	J				
	Non-detect	None	UĴ	R				

Note: All surrogate recoveries were within evaluation criteria.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No_	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate	<b>X</b>		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	777	х	
	conjunction with other QC criteria and determine the need for qualification of the data for samples from the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note:

Samples SA2-MW-2-D and SA2-MW-10S were spiked and analyzed for VOCs. Chlorobenzene had MS/MSD recoveries (133 and 64, RPD = 21) which were outside of evaluation criteria (75-123/30). Bromomethane had a MSD recovery (143 and 190, RPD=28) which were outside of evaluation criteria (21-176, RPD=50). Since the LCS was within evaluation criteria, no qualification of data based on MS/MSD recoveries was required.

## 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA.
9.1	Is an LCS recovery form present?	√ <b>X</b>		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?		х	
9.4	If Level IV, verify the % recoveries are calculated correctly.	х		
	Action for specific compound outside the acceptance criteria: %R>UCL,			

Note:

LCS 680-49559/2 had Bromomethane recoveries of 115% and 67% (RPD = 52). Bromomethane's recovery evaluation criteria is 21-176% (RPD<50). Since both recoveries were within evaluation criteria, no qualification of data is required. Ten percent of the spiking compound recoveries for the LCS were recalculated using the LCS summary form, and no calculation or transcription errors were noted.

#### 10.0 Internal Standards (Code I)

					Yes	No	NA
10.1	Are internal star	idard areas for every sample	X				
		Area > +100%	Area < -50%	Area < -10%			
II.	Positive	J	J	J			
L	Non-detect	None	UJ	R			
Note:	The method spec	The method specification is for the continuing calibration to be compared to the mid-point initial					
10.2	Are retention tin	nes of internal standards with	nin 30 seconds of the associ	ated calibration standard?	X		

Action: The chromatogram must be examined to determine 11 any false positives or negatives exist. For shift of a large magnitude, the reviewer may consider partial or total rejection of the data for non-detects in that sample/fraction.			
---	--	--	--

Note:

All internal standard areas met criteria.

11.0 TCL Identification (Code W)	Yes	No	NA
Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard	<b>X</b>		
Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample	X		

Note:

.J TCL/TI	Quantitation and Reported Detection limits (Code K)	Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	(3,0 x		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X X		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations	х		

Note: For the validation of compound quantitation, ten percent of the detected results were recalculated from the raw data, and no calculation errors were noted.

1	3.0 Field Dup	licate Samples (Code F)	Yes	No	NA
	13.1	Were any field duplicates submitted for VOC analysis?	200	х	
	13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	10 to 4		X
		Action: No qualifying action is taken based on field duplicate results, however the data validator should			
	Note:	No field duplicates were submitted for VOC analysis.			

## 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QA	APP or use 95% for aqueous	2.52 <b>x</b> 4.4		
14.2	Number of samples:	22			
14.3	Number of target compounds in each analysis:	34			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$				
	% Completeness	100			

Note:

## DATA VALIDATION V. AKSHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer:	Steve Gragert	Project Name:	Sauget Area 2 Supp. Investigation
Date:	8/23/2006	Project Number:	21561683.80011
Laboratory S	evern Trent Laboratory - Savannah	SDG No.:	SAS048
· -		Review Level:	Level IV

#### Major Anomalies:

No samples were rejected.

#### **Minor Anomalies:**

No samples required qualification.

Field IDs:	SA2-MW-4-D	SA2-MW-1-M	SA2-MW-1-M-D
	SA2-MW-1-S	SA2-MW-10D	SA2-MW-2-M
	SA2-MW-10-S	SA2-MW-2-D	SA2-MW-10M
	SA2-MW-2-S	SA2-MW-8-D	SA2-MW-4-M
	SA2-MW-4-S	SA2-MW-3M-FB	SA2-MW-10M-FB
	SA2-MW-3-M	SA2-MW-3-S	SA2-MW-3-S-D
	SA2-MW-3-D		

## 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. Due to the level of dilution required, several surrogates were diluted out. Several MS/MSD recoveries were outside of evaluation criteria due to high levels of analytes in the parent sample.

## 2.0 Holding Time/ Preservation (Code H)

	Yes	No	NA
Do sample preservation, collection and storage condition meet method requirement?	X		
If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See		<b>x</b> 5.2	
Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		<b>X</b>	
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days	Do sample preservation, collection and storage condition meet method requirement?  If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days	Do sample preservation, collection and storage condition meet method requirement?  If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".  Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days

Note: All holding times were met.

#### 3.0 GC Instrument Performance Check (Code T)

		Yes	No	NA NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	A STATE	·····	
3.2	Have all samples been analyzed within twelve hours of the tune?	SERVE .		
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	X		
	If no, all standards, blanks, field samples and QC samples are rejected "R".			

Note: All tuning criteria were met.

#### 4.0 Blanks (Method Blanks and Field Blanks) (Code X - Field Blank Contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	87% X 17%		
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?		.x.	`
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?		<b>经营养性</b>	X
	Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be			
	qualified "U" and the detection limit elevated to the RL for estimate concentrations.	İ		
4.4	If Level IV, review raw data and verify all detections for blanks were reported.	х		

Note: The method blank and field blank (SA2-MW-3M-FB) were nondetect for all analytes. Review of chromatograms indicates all peaks present were accounted for or the concentrations reported were below the method detection limit.

## 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	<b>X</b>		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?		<b>X</b>	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			Х .
5.3	Do any SPCC compounds have an RRF les than specification or any other compounds $< 0.05$ (use 0.01 for poor responders like amines and phenols)? If yes, $J(+)/R(-)$ .			
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X	ess : Assesse	
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	X		-

Note: The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations and initial calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. All initial calibration met criteria. Recalculations of the RRFs and %RSD for four compounds per standard were performed, and no errors

## 6.0 Co. .aing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	( X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	Sint at	X	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.		X	
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	Z.XX		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		2x	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.	X		

Note:

A continuing calibration standard was not analyzed every 12 hours, although the samples were analyzed within 12 hours of the standards being ran. The laboratory case narrative indicated that the grand mean exception was applied to the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. Recalculation of the RF and %D for one compound per standard was completed, and no errors in calculation were noted.

#### 7.0 Surrogate Recovery (Code S)

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?	St. of Xo.		
7.2	Are surrogate recoveries within acceptance criteria specified in the QAPP for all samples and method blanks?	Sales Area	X	
7.3	Are more than one of either fraction outside the acceptance criteria?	X		
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?		х	
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?		х	
li .	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.			
	> UCL 10% to LCL < 10%			
	Positive J J			
	Non-detect None UJ R			

Note:

Samples SA2-MW-4-DDL and SA2-MW-2-DDL had low recoveries for 2-Fluorobiphenyl, Nitrobenzene-d5, and Terphenyl-d14 due to high dilutions. No qualification of data was required.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	. NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	X		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?	(2)	X	
i	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same			
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note:

Samples SA2-MW-10S and SA2-MW-4-D were spiked and analyzed for SVOCs. Various analytes were outside of evaluation criteria for both samples due to high levels in parent sample. No qualification of data required.

## 9.0 Lab. ..ory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	NO	INA
9.1	Is an LCS recovery form present?	X		
9.2	Is LCS analyzed at the required frequency for each matrix?	X.		
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?	X		
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; <lcl, "j"="" (+="" <30%="" be="" failures="" flagged="" j(+)="" only)<="" r(-).="" rpd="" should="" td="" uj(-);=""><td></td><td></td><td></td></lcl,>			
9.4	If Level IV, verify the % recoveries are calculated correctly.	Х		

Note:

All LCS recoveries were within evaluation criteria. Ten percent of the spiking compound recoveries for the LCS were recalculated using the LCS summary form, and no calculation or transcription errors were noted.

## 10.0 Internal Standards (Code I)

					Yes	No	NA
10.1	Are internal star	ndard area of every sample a	nd blank within upper and l	ower QC limits for each con	tinuing 🔝 🗴 🤾		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J			
	Non-detect	None	UJ	R			
Note:							
	The method spe	cification is for the continuin	ibration.				
	1	ontinuing calibration. Thus, i	-	-		1	
		sional judgment, the reviewe		•	- I		
10.2	Are retention tir	nes of internal standards with	in 30 seconds of the associa	ited calibration standard?	X		
	Action: The ch	romatogram must be examine	ed to determine if any false	ositives or negatives exist.	For shift		,
	of a large magni	itude, the reviewer may consi	der partial or total rejection	of the data for non-detects i	n that		
	sample/fraction.		•				

Note:

All internal standard areas were within criteria.

## 11.0 T Jentification (Code W)

		Yes	No	NA
II	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	x	,	

Note:

## 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	990 <b>x</b>		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations	X		

Note:

For the validation of compound quantitation, approximately ten percent of the detected compound results were recalculated from the raw data, and no calculation errors were noted.

## 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	1975 SE	X	
13.2	Were all RPD or absolute difference values within the control limits?			X
	No action is taken based on field duplicate results, however the data validator should provide a qualitative			
	assessment in the data validation report.			

Note: Field duplicates were not submitted for SVOC analysis.

## 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample,	X		
	90% for soil sample)				
14.2	Number of samples:	22			
14.3	Number of target compounds in each analysis:	65			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
	% Completeness	100			

Note:

#### DATA VALIDATION WORKSHEET HERBICIDES ANALYSIS

Sauget - Area 2 Reviewer: Steve Gragert **Project Name:** Date: 8/24/2006 Project Number: 21561683.80011 Laboratory Severn Trent Laboratory - Savannah SDG No.: **SAS048** Level IV Review Level: Major Anomalies: Pentachlorophenol was rejected in SA2-MW-10S due to zero recovery. Minor Anomalies:

No other qualifications of data were required.

Field IDs:	SA2-MW-4-D	SA2-MW-1-M	SA2-MW-1-M-D
	SA2-MW-1-S	SA2-MW-10D	SA2-MW-2-M
	SA2-MW-10-S	SA2-MW-2-D	SA2-MW-10M
	SA2-MW-2-S	SA2-MW-8-D	SA2-MW-4-M
	SA2-MW-4-S	SA2-MW-3M-FB	SA2-MW-10M-FB
	SA2-MW-3-M	SA2-MW-3-S	SA2-MW-3-S-D
	SA2-MW-3-D		

#### 1.0 Chain of Custody/Sample Condition

		Yes	NO	NA NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	50 X X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x	4.0	

Note:

The laboratory case narrative indicated the grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds in the CCV is less than or equal to 15%. MS/MSD recoveries were outside evaluation criteria for dichloroprop, 2,4-DB and pentachlorophenol. This will be discussed in the appropriate section below.

## 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X 25 %		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		x	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		3 % X	

Note: All holding times were met. 3.0 \_\_\_\_nks (Method Blanks and Field Blanks) (Code x - Field Blank Contamination). Code z - Method blank contamination)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?	x:3		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?		X	
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.	x		

Note: All method and field blanks (SA2-MW-3M-FB and SA2-MW-10M-FB) met criteria. Review of chromatograms indicated that other than surrogates, no peal positively identified above the method detection limit on either analytical column for herbicides. No data qualifications were required based on blank sample.

#### 4.0 Initial Calibration (Code r)

			Yes	No	NA
	4.1	Are Initial Calibration summary forms present and complete for each instrument used?	<b>.</b> . <b>X</b>		
Ιſ	4.2	Are calibration factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument	12 X		
1		If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
	4.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	X		
			<del></del>	7 1	

Note: Initial calibration was met. A minimum of 10 percent of the calibration curves was recalculated and no transcription or calculation errors were noted.

#### 5.0 Continuing Calibration (Code c)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	X		
5.2	Has a continuing calibration standard been analyzed every 12 hours?	X X		
5.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 20%)?	х		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
5,5	If Level IV, calculate a sample of CFs and %Ds from ave CF to verify correct calculations.	X		

Note: The grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when on more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds is less than or equal to 15%. The CCV was within evaluation criteria by applying the grand mean, no qualification of data was required. Additionally, a min ten percent of the herbicide calibration percent drifts was recalculated from the raw data, for both columns, and no transcription or calculation errors were no

#### 6.0 Surrogate Recovery (Code s)

				Yes	No	NA
6.1	Are all samples listed on the	appropriate Surrogate Recovery	Summary Form ?	A X		
6.2	Are surrogate recoveries with	nin acceptance criteria specified i	n the QAPP for all samples?	<b>X</b>		<del></del>
6.3	If No in Section 6.2, were the	ese sample(s) or method blank(s)	reanalyzed?			x
6.4	If No in Section 6.3, is any sa	imple dilution factor greater than	10? (Surrogate recoveries may be diluted out.)			x
	> UCL	10% to LCL	< 10%			
	Positive J	J	J			· · · · · · · · · · · · · · · · · · ·
	Non-detect None	UJ	R			

Note: All surrogate recoveries met evaluation criteria.

7.0 . ...trix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Luplicate (Code m - recovery, Code d - RPD)

		Yes	NO	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	A SULTAN		
7.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	X		
7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	<b>***</b> *********************************	х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same	1		
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note:

Samples SA2-MW-2-D and SA2-MW-10S were spiked and analyzed. SA2-MW-2-D had a recovery of Pentachlorophenol (38,42/12) outside of evaluation (46-144/40). SA2-MW-10S had MS/MSD recoveries of 2,4-DB (168,135/21), LCS recoveries were within evaluation criteria; therefore, no qualification outside of evaluation criteria for 2,4-DB (35-140/40) and Pentachlorophenol (0,0/NC) outside of evaluation criteria Pentachlorophenol (46-144/40). Pentachlorophenol (38,42/12) were qualified "R" since there was zero recovery.

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-10S	Pentachlorophenol	R	m	680-18156	MS/MSD recovery of < 10%

## 8.0 Laboratory Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD)

		Yes	No	NA
8.1	Is an LCS recovery form present?	Carlos X Carlos		
8.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	\$ ≥ ∆X(Z <sup>*</sup>		
8.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X.		
8.4	If Level IV, verify the % recoveries are calculated correctly.	x		
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			_

Note: All LCS recoveries met evaluation criteria. A minimum of ten percent of the LCS recoveries was recalculated, and no calculation or transcription errors we

## 9.0 TCL Identification (Code w)

		Yes	No	NA
9.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in			
	the continuing calibration?	X.		

Note:

## 10.0 TCL Quantitation and Reported Detection limits (Code p)

		Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?	000 X 000		
10.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	22.00		х
10.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
10.4	If Level IV, calculate a sample of positive results to verify correct calculations	X		

Note: Samples did not require dilutions. Approximately 10 percent of the sample results were recalculated and no calculations or transcription errors were noted.

11.6 eld l	Duplicate Samples (Code f)	Yes	No	NA
11.1	Were any field duplicates submitted for herbicide analysis?		Х	
11.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?		х	
}	Action: No qualifying action is taken based on field duplicate results, however the data validator should			
	provide a qualitative assessment in the data validation report.			
Note:	No field duplicates were analyzed as part of this SDG.			

## 12.0 Data Completeness

100			Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit: Check QAF	PP or use 95% for aqueous sample,	36652000000	x	<del></del>
12.2	Number of samples:	19			
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:	10			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	94.73684211			

Note: Pentachlorophenol was rejected in herbicide sampleSA2-MW-10S.

#### DATA VALIDAT. WORKSHEET PESTICIDES/PCBs ANALYSIS

Reviewer:	Steve Gragert	Project Name:	Sauget - Area 2
Date:	8/23/2006	Project Number:	21561683.80011
Laboratory Sev	vern Trent Laboratory - Savannah	SDG No.:	SAS048
· ·	· · · · · · · · · · · · · · · · · · ·	Review Level:	Level IV

Major Anomalies:

No samples were rejected.

Minor Anomalies:

Qualifications were made on SA2-MW-4-D, due to low surrogate recoveries and low internal standard recoveries.

Field IDs:

SA2-MW-4-D

## 1.0 Chain of Custody/Sample Condition

			Yes	No	NA
	1.1	Do Chain-of-Custody forms list all samples analyzed?	CX L		
	1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X ***		
	1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of			
ŀ		samples, analytical problems or special circumstances affecting the quality of the data?	x	16.0	

Note:

For Pesticides, the laboratory case narrative indicated that the surrogate recovery for Decachlorobiphenyl was outside QC limits for SA2-MW-4-D. The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation.

For PCBs, the laboratory case narrative indicated Internal Standard recovery for the SA2-MW-4-D (97926) was below the area lower limit (115094) for the internal standard Chrysene-d12. All analytes for SA2-MW-4-D were nondetect; therefore, they were qualified UJ. No other issues were noted in either case narrative.

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-4-D	All PCBs	UJ	i	680-18156	Low IS Recovery

## 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler was			
	elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached			
	Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		X	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			***************************************
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		X X	-
Note:	All holding times were met.		<del></del>	

All holding times were met.

#### 3.0 Blank lethod Blanks and Field Blanks) (Code x - Field Blank Contamination, e z - Method blank contamination)

		Y es	NO	NA
3.1	Is a Method Blank Summary form present for each batch?	#192 (X) X-27		
3.2	Do any method blanks have positive results (TCL)?		# EX	•
3.3	Do any field/rinse/equipment blanks have positive results (TCL)?		是海道。	<u> </u>
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.	x		

Review of chromatograms indicate all peaks present were accounted or the concentrations reported were below the method detection limit.

4.0 GC/ECD Instrument Performance Check (Code b)

		Yes No	NA
4.1	Are Endrin and 4,4'-DDT breakdown forms present?	X X	
4.2	Have all samples been analyzed within twelve hours of the performance check sample?	46 X X X X X X X X X X X X X X X X X X X	
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".		
4.3	Have percent breakdown criteria < (15%) for endrin and 4,4'-DDT been met?	X	
	If no, all standards, blanks, field samples and QC samples are rejected "R".		

Note:

Note:

#### 5.0 Initial Calibration (Code r)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X COLOR		
5.2	Are response factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument	X		
	If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.	X		

Note:

Initial calibration met criteria and recalculations of the RFs and %RSD for four compounds per standard were performed, and no errors in calculation were noted.

#### 6.0 Continuing Calibration (Code c)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?	X		
6.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 15%)?	x		
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
6.4	If Level IV, calculate a sample of CFs and %Ds to verify correct calculations.	X		

Note:

The grand mean exception was applied to continuing calibration verification standards in this package. The rule is described in Method SW-846 and states that when on or more compounds fails to meet acceptance criteria, the initial calibration (ICAL) may be used for quantitation if the average percent difference (%D) of all the compounds in the CCV is less than or equal to 15%. A calculation of the %D for each target compound and a calculation of the grand mean for specific CCVs was performed. All grand mean calculations were less than 15% therefore, no qualification of data was required. Recalculation of the RF and %D for one compound per standard was completed, and no errors in calculation were noted.

## 7.0 Surre ... e Recovery (Code s)

				Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?		4- (5-), X. (5-)			
7.2	Are surrogate recoveries within	acceptance criteria specified in	the QAPP for all samples?		х	
7.3	If No in Section 7.2, were these	If No in Section 7.2, were these sample(s) or method blank(s) reanalyzed?			X	
7.4	If No in Section 7.3, is any samp	ole dilution factor greater than	10? (Surrogate recoveries may be diluted out.)			X
)	> UCL	10% to LCL	< 10%			
	Positive J	J	J			
	Non-detect None	UJ	R			

Note:

For Pesticides, the surrogate Decachlorobiphenyl was outside QC limits in sample SA2-MW-4-D. All analytes in SA2-MW-4-D were non-detect and did not require dilutions. All non-detects in SA2-MW-4-D were qualified estimated non-detect "UJ". All PCB surrogates were within evaluation criteria.

Field ID	Analyte(s):	Qualification	Code;	Run# Justification
SA2-MW-4-D	All Pesticides	ŬJ	S	680-18156 Low surrogate recover

## 8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

			Yes	No	NA
	8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	34.50.90.000		X
	8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?			x
	8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	200 Car.		X
		Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
		other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.		[	
L		Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: No MS/MSDs were requested for this data package.

## 9.0 Laboratory Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD)

		Yes No	NA
9.1	Is an LCS recovery form present?		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X	
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X	
9.4	If Level IV, verify the % recoveries are calculated correctly.	X	
	Action for specific compound outside the acceptance criteria: %R>UCL,		
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)	·	

Note:

LCS recoveries met criteria and ten percent of the spiking compound recoveries for the LCS were recalculated using the LCS summary form, and no calculation or transcription errors were noted.

## 10.0 TCL mentification (Code w)

	_		Yes	No	NA
	10.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
-	Note:				

## 11.0 TCL Quantitation and Reported Detection limits (Code p)

		Yes	No	NA NA
11.1	Are RLs used consistent with those specified in the QAPP?	2.62 × X**		
11.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	10 m 10 10 10 10 10 10 10 10 10 10 10 10 10		Х
11.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X X	
11.4	If Level IV, calculate a sample of positive results to verify correct calculations	X		

Note:

No dilutions were required, all analytes were non-detected. For the validation of compound quantitation, approximately ten percent of the detected compound results were recalculated from the raw data, and no calculation errors were noted. Review of the data indicated sample results were adjusted for moisture content, and the correct reporting limits were reported.

## 12.0 Field Duplicate Samples (Code f)

		Yes	No	NA.
12.1	Were any field duplicates submitted for analysis?	ME STANKE	х	
12.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?		X	
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a qualitative assessment in the data validation report.			
Note:	No field duplicates were analyzed as part of this SDG.	·····		

13.0 Data Completeness

			Yes	No	NA
13.1	Is % completeness within the control limits? (Control limit: Check QAPP	or use 95% for aqueous sample, 90% for	X		
13.2	Number of samples:	1			
13.3	Number of target compounds in each analysis:	21			
13.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$				
ł	% Completeness	100			

Note:

#### DATA VALIDATION WORY Inorganic - ICP, ICP-N

EET - Level III Review AA, and CVAA

Review				
Date:		8/23/2006		
Laborat	ory	Severn Trent Laboratory	- Savannah	
Major Anom	alies:			
	No samples were reject	ed	<u> </u>	
Minor Anom	alies:			
	Samples required quality	fication due to sample results less th	nan 5X the blank result.	
Field IDs:	SA2-MW-4-D	SA2-MW-1-M	SA2-MW-1-M-D	
	SA2-MW-1-S	SA2-MW-10D	SA2-MW-2-M	
	SA2-MW-10-S	SA2-MW-2-D	SA2-MW-10M	
	SA2-MW-2-S	SA2-MW-8-D	SA2-MW-4-M	
	SA2-MW-4-S	SA2-MW-3M-FB	SA2-MW-10M-FB	
	SA2-MW-3-M	SA2-MW-3-S	SA2-MW-3-S-D	
	SA2-MW-3-D			

Project Name:	Sauget - Area 2	
Project Number:	21561683.80011	
SDG No.:	SAS048	
Daviery Levels	Lavel IV	

## 1.0 Chain of Custody/Sample Condition/Raw Data

1.0 Chain of	Custody/Sample Condition/Raw Data		ICP	I	CP-MS		JFAA	CV	AA-I	-Ig
		Yes	NoN	A Yes	No NA	Yes	No N.	A Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples that were analyzed?	S.x		300		14.5		/ X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		14/1/97		2.5		X		
1.3	Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt condition of samples, analytical problems or special circumstances affecting the quality of the data?								x	
1.4	Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples: 4 °C + 2°C)	×	1	***		1		×		
1.5	Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes. % solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	x				X		X		

Note: The laboratory case narrative indicated that MS/MSD samples, SA2-MW-2-D and SA2-MW-10S were analyzed at a dilution due to high levels of analytes (potassium in the parent sample. The MS/MSD for calcium, potassium, sodium, and iron were outside control limits. No qualification of data was required.

2.0 Holding Ti	me (Code h)		ICP	_		ICP-N	1S		FA	A	CVA	A-H	g
		Yes		ÑΑ	Yes	No	NĀ	Yes	No	NA	Yes 1	Vo	NA
2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) See attached Holding Time Table.  Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria) J(+)/R(-).		X								4. A. A. A. A. A. A. A. A. A. A. A. A. A.	x	
Note:	All samples met holding time criteria.												

<sup>†</sup> nstrume	nt Calibration (Code c)	Ţ,	ICP IC	P-MS		FAA	CVAA	-Hg
		Yes	No NA Yes	No NA	Yes I	NOINA	Yes INO	NA.
3.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS. plank + one standards GFAA: blank + three standards; CVAA: blank + five standards)	X.					X.	
3.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).			7	200		Sec.	X
3.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: In no, use professional judgment to determine affect on the data and note in reviewer narrative.	×					X-	
3.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.						X:	
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).  Action: R(+/-) J(+)/UJ(-) J(+) R(+)  Mercury < 65% 65% - 79% 121% - 135% > 135%  Other Metals < 75% 75% - 89% 111% - 125% > 125%	1 X					X.	

Note: Instrument calibration for CVAA was not listed as correlation coefficients, it was listed as %R and all %Rs were within evaluation criteria.

## 4.0 Blanks (Code o - Calibration blank failure, Code p - Preparation blank failure, Code x - Field blank failure)

		]]	JICP		IC.	P-M	S	G	raa	J CV	AA-H	ıg
		Yes	No	NA	Yes	No 1	VA	Yes	No NA	Yes	No	NA
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch, per matrix and per level)?	X					3 0	270		x		
4.2	Are there reported PB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.										X	
4.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	X.					A CONTRACTOR			x		
4.4	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data to note in reviewer narrative.						30 ca 20 ca			i.		
4.5	Are there reported ICB or CCB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x			37						x	
4.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	x			E					11.27.0037 1000	x	
4.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		X						135 135 115		x	

Note: Analytes chromium (.0015 mg/L) and copper (0.0022 mg/L) results that were less than 5 times the continuing calibration blank values and were qualified "U."

SA2-MW-1-M Chromium U 680-18156 <5X CCB contamination	* Field ID	Analyte(s)	Qualification (Qualification)	Run#*'	Justification # 14
SA2-MW-1-S         Copper         U         680-18156         <5X CCB contamination           SA2-MW-2-M         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-1-M		U		
SA2-MW-2-M         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-2-S         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-1-M-D	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-2-S         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-2-S         Copper         U         680-18156         <5X CCB contamination	SA2-MW-1-S	Copper	U	680-18156	<5X CCB contamination
SA2-MW-2-S         Copper         U         680-18156         <5X CCB contamination           SA2-MW-8-D         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-2-M	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-8-D         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-4-M         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-2-S	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-4-M         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-4-S         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-2-S	Copper	U	680-18156	<5X CCB contamination
SA2-MW-4-S         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-3-M         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-8-D	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-3-M         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-3-S         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-4-M	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-3-S         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-3-S         Copper         U         680-18156         <5X CCB contamination	SA2-MW-4-S	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-3-S         Copper         U         680-18156         <5X CCB contamination           SA2-MW-3-S-D         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-3-M	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-3-S-D         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-3-S-D         Copper         U         680-18156         <5X CCB contamination	SA2-MW-3-S	Chromium	U	680-18156	<5X CCB contamination
SA2-MW-3-S-D         Copper         U         680-18156         <5X CCB contamination           SA2-MW-10M         Chromium         U         680-18156         <5X CCB contamination		Copper	U	680-18156	<5X CCB contamination
SA2-MW-10M         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-10D         Chromium         U         680-18156         <5X CCB contamination	SA2-MW-3-S-D	Chromium	. U	680-18156	<5X CCB contamination
SA2-MW-10D         Chromium         U         680-18156         <5X CCB contamination           SA2-MW-10S         Copper         U         680-18156         <5X CCB contamination	SA2-MW-3-S-D	Copper	U	680-18156	<5X CCB contamination
SA2-MW-10S Copper U 680-18156 <5X CCB contamination		Chromium	U	680-18156	<5X CCB contamination
		Chromium	Ü	680-18156	<5X CCB contamination
SA2-MW-10S   Chromium U 680-18156 <5X CCB contamination		Copper	Ü		
	SA2-MW-10S	Chromium	U	680-18156	<5X CCB contamination

~ · · · ·	CP Interfere	ice Check Sample (ICS) (Code n)		ICP _		CP-MS		GFA.			AA-I	
			Yes	NoNA	Yes	No NA	Yes	No	NA	Yes	No	NA
Ì	5.1	Was ICS AB analyzed at beginning of each ICP run (or at least twice every 8 hours), and at the beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	727									
		beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	X				}			1	- 1	
		Are the ICS AB recoveries within 80% - 120%?	X.		100	2	]			ļ	1	i
	5.3	Are the results for unspiked analytes (in ICS A) < + IDL?	X.		W. 17					ĺ		
	5.4	f not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the ICS?	The state of		36310		]					į
		Action: Not Spiked Analytes Spiked analytes (ICS AB analytes)			States					į	İ	
1		<-IDL > IDL <50% 50% - 79% > 120%				2						
L		UJ(-) J(+) K(+/-) J(+)/UJ(-) J(+)	***		1	3						

Note:

6.0 Laboratory	Control San	nple (LCS) (C	ode I - Recov	ery, Code e - R	PD)			Vec	ICP NoINA		P-MS		FAA	CV.	AA-I	lg NA
6.1	Was an LCS	S prepared and el)? Action: I	analyzed at th	ne correct freque	ency (one per 20 s	amples, per batc	h, per matrix	YX.		103		103		X		NA.
6.2	Is any LCS	recovery outs : as per EPA-I	ide the contro		Aqueous 50% - 79% J(+)/UJ(-)				X						x	

Note: All recoveries met evaluation criteria.

#### 7.0 Laboratory Duplicates (Code k)

Laborato	ry Duplicates (Code k)	ICP		CP-MS		GFAA		AA-	
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes no associated with Duplicate results.		IA Yes	1 1	NA Yes		NA Yes		NA
7.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment Note in worksheet.	x				30		X	
7.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± PQL for aqueous, and RPD < 35% or difference < ±2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.		x						х

Note: The laboratory duplicated SA2-MW-10S and SA2-MW-2-D for both ICP and CVAA. All RPDs were within evaluation criteria.

#### 8.0 Spike Sample Analysis - Pre-Digestion (Code m - Recovery, Code d - RPD)

8.0 Spike Sar	nple Analysis -Pre-	Digestion (Code	m - Recovery, Code d - R	PD)		ICP		ICP-			FAA		/AA-	
						Noll	VA Y	es N	oNA	Yes	Noll	NA Yes	No	NA
8.1	Was a spiked sar per matrix and p with matrix spike	er level)? Action	analyzed at the correct fre If no, J(+), with profess	quency (one per 20 samples, per bate ional judgment, analytes not associate	n, d							5 x		
8.2	Note in worksho	eet.		yes, $J(+)$ with professional judgment $k$ when it is the only aqueous sample		1. X. X. X. X. X. X. X. X. X. X. X. X. X.							X	
8.3	control limit of concentration.)			ntration, are spike recoveries within that alytes with concentration > 4 x spil  %R < 30%  J  R								X		

3of4

Samples SA2-MW-10S and SA2-MW-2-D were spiked and analyzed. All recoveries were within evaluation criteria. Note:

nstrumen	t Detection Limits (IDL)		ICP			CP-M		ĞF.		CVA	
9.1	Are all IDL equal to or less than the reporting limits specified?	Yes		$\overline{}$	Yes			Yes N		Yes N	o NA
Note:	The air 122 equal to or less than are reporting times specified.	35 A 37.	l		water Committee	<u> </u>	!	2422.7		A	<u></u>
11000.											
10.0 ICP Seria	ll Dilutions (Code s)		ICP			CP-M		GF.		CVA	
		Yes	No	NA	Yes	No	NA]	Yes N	o NA	Yes N	ol NA
10.1	Were serial dilutions performed?	X X			機構造		$\Box$				
10.2	Was a five-fold dilution performed?	2. <b>X</b> (6.			2007/509					1	Ì
10.3	Did the serial dilution results agree within 10% for analyte concentration > 50 x the IDL in the	#77.55				1. [		1			
	original sample? If no, J(+).	X					L				
Note:	Sample SA2-MW-4-D was diluted and analyzed. All %Ds were within evaluation criteria.						_				
110 Elala D	diant County (Code 8		ICP		- 1/	CP-M	c T	GF	A A	CVA	A TT -
וויט דופוט שון	olicate Samples (Code f)									Yes N	
11.1	Were any field duplicates submitted for metal analysis?	200			CARLE !		==	C254		x	
					3000		500	S-2-3		3333	
11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < 35% or difference < ± 2 x PQL and For solids, RPD < 50% or difference < ±4 x PQL)			x	5.00		1		1 1		x
Note:	Field duplicates were not submitted for metals analysis.	1	-			<u> </u>		***************************************			
	·										
12.0 Result Ve	rification (Code Q)		ICP			CP-M		GF.		CVA	
		Yes	No						o NA	Yes N	o NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?		1—1	X	THE STATE OF						X
Note:	Were all dilution reflected in the positive results and detection limits?  The matrix of samples analyzed was aqueous, no samples submitted were solid-matrix.	X			A STOR				44		X
Note.	The matrix of samples analyzed was aqueous, no samples submitted were solid-matrix.										
13.0 Data Com	pleteness										
13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous	1									
	sample, 90% for soil sample)										
122	Number of complete	170			Λ	T		7		ורסו	

13.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample, 90% for soil sample)					
13.2	Number of samples:	19	0	T	0	[19]
13.3	Number of target compounds in each analysis:	22	0		0	1
13.4	Number of results rejected and not reported:	0	0	1 [	0	0
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$			] Г		
	% Completeness	100	0	1	U	100

## DATA VALIDATION WORKSHEET WET CHEMISTRY ANALYSIS

Reviewer: Steve Gragert Project Name: Sauget - Area 2 Supp. Invest. Project Number: 21561683.80011 Date: 8/24/2006 SDG No.: SAS048 Laboratory Severn Trent Laboratory - Savannah Level IV Dissolved Gasses, chloride, ammonia, nitrate/nitrite, sulfate, Total Review Level: Test Name: RSK 175, 325.2, 353.3, 375.4, 415.1, 310.1 Method No.:

#### Major Anomalies:

No samples were rejected, all data was useable.

#### **Minor Anomalies:**

Samples were qualified do to field blank contamination.

~	a	0.4.5.4.5.4.5.4	2121EV 116
Field IDs:	SA2-MW-4-D	SA2-MW-1-M	SA2-MW-1-M-D
	SA2-MW-1-S	SA2-MW-10D	SA2-MW-2-M
	SA2-MW-10-S	SA2-MW-2-D	SA2-MW-10M
	SA2-MW-2-S	SA2-MW-8-D	SA2-MW-4-M
	SA2-MW-4-S	SA2-MW-3M-FB	SA2-MW-10M-FE

SA2-MW-3-S

SA2-MW-3-M SA2-MW-3-D

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	<b>X</b>		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition	Х	45 A CA	

Note:

The laboratory case narrative indicated the MS/MSD recoveries for Chloride and Ammonia were outside of evaluation criteria due to abundance of analyte present in the parent sample. The case narrative indicates Nitrite was analyzed outside of holding time for the field blanks SA2-MW-3M-FB and SA2-MW-10M-FB, due to analyst error. The COC requests Ammonia as the only analysis ran for wet chemistry analysis. The laboratory case narrative indicated the methane results exceeded the upper calibration range of the flame ionization detector in 7 samples; therefore, the results were reported from the thermal conductivity detector.

SA2-MW-3-S-D

## 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	F 1 <b>X</b> 38		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached	X	<b>37</b> (38)	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, J(+)/R(-).	X	1,345	

Note:

Nitrite was analyzed outside holding time by approximately 11 days. The laboratory case narrative failed to mention that nitrate was also analyzed outside of holding time by approximately 11 days. Both samples were field blanks; therefore, no qualification of data were required.

#### 3.0 Blanks ... Method Blanks and Field Blanks) (Code x - Field Blank Contamination), code z - Method blank contamination)

 		Yes	No	<u>NA</u>
3.1	Is a Method Blank Summary form present for each batch?	X		
3.2	Do any method blanks have positive results?		>60 X X '5	
3.3	Do any field/rinse/equipment blanks have positive results?	Х		
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.	Х		

Note:

Field blank SA2-MW-3M-FB had detections of ammonia (0.060mg/L) and TOC (0.52mg/L). The TOC result for the parent sample SA2-MW-3-M was qualified "U" due to field blank contamination. Field blank SA2-MW-10M-FB had detections of ammonia (0.052mg/L), Sulfate (94mg/L) and TOC (1.5mg/L). All results for the parent sample were >5X the associated blank concentration; therefore, no qualification of data was required. Raw data was

Field ID	Analyte(s)	Qualification	Code	Run #	Justification
SA2-MW-3-M	TÓC	UJ	x	680-50475	Field Blank contamination

#### 4.0 Initial Calibration (Code c)

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	<b>X</b>		
4.2	Are correlation coefficients stable (>0.995) over the concentration range of the instrument?	x		
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.	X		

Note:

All initial calibration were within evaluation criteria. Approximately 50 percent of the initial calibration and ICV recoveries were recalculated and compared to the raw data; no calculation or transcription errors were noted.

## 5.0 Continuing Calibration (Code r)

	·	Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	The National Association		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	** X ***		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X.34	
	If yes, a marginal increase in response $\geq 20\%$ then J(+) only; a decrease in response then J(+)/ UJ(-). For $\%$ R <			
5,4	If Level IV, calculate a sample of %Rs.	х		

Note:

All continuing calibrations were within evaluation criteria. Approximately 10 percent of the CV sample recoveries were recalculated and compared to the raw data. No calculation or transcription errors were noted.

## 6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA NA
6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X		
6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty	X		
6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	(A) (A) (A) (A)	Х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			

Note:

Samples SA2-MW-10S and SA2-MW-2-M were spiked and analyzed. For sample SA2-MW-10S, Ammonia recoveries (79,79/0) and Sulfate recoveries (150,148/1) were outside of evaluation criteria for Ammonia (90-10/30) and Sulfate (75-125/30). For sample SA2-MW-2-M, Ammonia recoveries (83,80/1) also outside of evaluation criteria (90-110/30). Since all LCS results were within evaluation criteria, no qualification of data was required.

# 7.0 Labo. .y Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD,

		res No	INA
7.1	Is an LCS recovery form present?	M7565X05689	
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	<b>X</b> 26	
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X	
7.4	If Level IV, verify the % recoveries are calculated correctly.	x	
	Action for specific compound outside the acceptance criteria: %R>UCL,		

Note:

All LCS recoveries within evaluation criteria. A minimum of ten percent of LCS/SRM recoveries were recalculated and compared to the raw data; no calculation or transcription errors were noted.

# 8.0 Analyte Identification

			Yes	No	NA NA
	8.1	Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the			
1		standard RRT in the continuing calibration?	X		

Note:

# 9.0 Analyte Quantitation and Reported Detection limits

		Yes	No	NA
9.1	Are RLs used consistent with those specified in the QAPP?	<b>x</b> -		
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	<b>X</b>		
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	X	10 mm 17	
9.4	If Level IV, calculate a sample of positive results to verify correct calculations	X		

Note:

The methane results exceeded the upper calibration range of the FID detector in sample SA2-MW-1-D so the results were reported from the TCD detector. A minimum of ten percent of the validated sample results was recalculated to validate that analyte quantitation was derived accurately, and no calculation

# 10.0 Fiel plicate Samples (Code f)

	Y es	NO	INA.
10.1 Were any field duplicates submitted?	A CONTRACTOR	X	
10.2 • Were all RPD or absolute difference values within the control limits outlined in the QAPP?		Х	
Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			
qualitative assessment in the data validation report.			

Note: No field duplicates were submitted for analysis.

# 11.0 Laboratory Duplicates (Code k)

		Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per	1	X	
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in		大學	X
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < ± PQL for aqueous, and RPD	8000 Feb. 3		X

Note: The laboratory did not duplicate any samples for analysis.

# 12.0 Data Completeness

	<u> </u>		Yes	No	NA
12.1	Is % completeness within the control limits? (Control limit: Check C	OAPP or use 95% for aqueous sample, 90%	2.37.85 A 1.75.00	Х	
12.2	Number of samples:	19			
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:	3			
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	98.42105263			

SDG No: SAS049



# DATA VALIDA JN WORKSHEET VOLATILE ORGANIC ANALYSIS

 Reviewer:
 Steve Gragert
 Project Name:
 Sauget - Area 2

 Date:
 8/24/2006
 21561683.80011

 Laboratory
 Severn Trent Laboratory - Savannah
 SDG No.:
 SAS049

 Review Level:
 Level III

Major Anomalies:

No samples were rejected

Minor Anomalies:

One sample was qualified "J" based on elevated LCS recovery. Twelve samples were qualified "UJ" due to CCV %Ds > 20%.

Field IDs:

TB-13	SA2-MW-6-M	SA2-MW-6-M-Dup
SA2-MW-6-M-D	SA2-MW-5-D	SA2-MW-5-M
TB-14	SA2-MW-9-S	SA2-MW-9-D
SA2-MW-9-D-D	SA2-MW-9-M	SA2-MW-9-S
SA2-MW-9-S	SA2-MW-7-M-FB	SA2-MW-7-M
SA2-MW-7-D	TB-15	

#### 1.0 Chain of Custody/Sample Condition

		Yes	No	NA.
1.1	Do Chain-of-Custody forms list all samples analyzed?	%:≥ <b>x</b>		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,	X		

Note:

The laboratory case narrative indicates LCS recoveries outside of evaluation criteria for carbon disulfide and chloromethane. The MS/MSD that was spiked and analyzed for VOCs had recoveries outside of evaluation criteria for Chloromethane and Vinyl chloride. These issues will be discussed in the appropriate sections below.

#### 2.0 Holding Time/ Preservation (Code H)

					Yes	No	NA
2.1			rage condition meet me		X.	<u> </u>	
	unpreserved or temp	erature is outside the r	ange 0° (but not frozer	<2° >6°C, etc.), comment in re ) to 10° flag all positive results itive detections "J" and non-det	with a		
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? If yes, $J(+)/UJ(-)$ .					X	
	Matrix	Preserved	Aromatic	All others			
	Aqueous	No	7 days	14 days			
		Yes	14 days	14 days		1 :	
	Soil/Sediment	$4^{\circ}C \pm 2^{\circ}C$	14 days	14 days			
2.3	Have any technical h	olding times been gro	ssly (twice the holding	ime) exceeded? If yes, J(+)/R(-	·).	X	

Note:

#### 3.0 GC/MS Instrument Performance Check (Code T)

			Yes	No	NA
	3.1	Are GC/MS Tuning and Mass Calibration forms present for bromofluorobenzene (BFB)?	.a.⇔ <b>x</b>		
1	3.2	Have all samples been analyzed within twelve hours of the BFB tune? If no, flag R.	74 <b>X</b>		
	3.3	Have ion abundance criteria for BFB been met for each instrument used? If no, flag R.	ੱ함 <b>; x</b> : ``		

Note: All tuning criteria was met.

#### 4.0 Blanks (Method Blanks, Field Blanks and Trip Blanks)

(Code X - Field Blank Contamination, Code Y - Trip blank contamination, Code Z - Method blank contamination)

			Yes	No	NA_	
	4.1	is a Method Blank Summary form present for each batch?	ARX X			
	4.2	Do any method blanks have positive VOA results (TCL and/or TIC)?		STAX AND		
	4.3	Do any field/trip rinse/equipment blanks have positive VOA results (TCL and/or TIC)?	X	<b>米华三次</b>		
		Action: Positive sample results <5X (or 10X for common volatile lab contaminants- methylene chloride acetone, and 2-butanone) the blank concentration should be qualified "U". The result should be elevated	1			
1		to the RL for estimate (laboratory "J" flagged) concentrations.				
	4.4	If Level IV, review raw data and verify all detections for blanks were reported.			x	_

Note: Field blank SA2-MW-7-FB had a detection of Toluene (1.9 µg/L). The parent sample was nondetect for toluene; therefore, no qualification of data was required.

#### 5.0 GC/MS Initial Calibration (Code C)

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	A Y		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?	** X		
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
5.3	Do any SPCC compounds have an RRF less than specification or any other compounds < 0.05 (use 0.01		X	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	<b>X</b> ; <b>X</b> ; · · · ∖		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: Initial calibration was within evaluation criteria.

#### 6.0 Continuing Calibration (Code C)

Note:

		Yes	No	NA
6.1		', <b>X</b>		
6.2	Has a continuing calibration standard been analyzed every 12 hours?		X	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.	X X		
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	x		
	If yes, a marginal increase in response >20% then $J(+)$ only; a decrease in response then $J(+)/UJ(-)$ . For %D > 50%, flag R.			
6.5	Do any compounds have an RRF < 0.05 (use 0.01 for poor responders)? If yes, $J(+)/R(-)$ .		X	
6,6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			Х

A continuing calibration standard was not analyzed every 12 hours, although all samples were analyzed within 12 hours after a standard was analyzed. CCV 10071706C2MB had Bromomethane (-25.2%) %Ds >20%.

Field ID.	Analyte(s)	Qualification	Code	778.25028. Run#	Justification 354
SA2-MW-6-M	Bromomethane	UJ	C	680-18316	CCV %D >20%
\$A2-MW-6-M-Dur	Bromomethane	UJ	C	680-18316	CCV %D >20%
SA2-MW-6-D	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-9-D	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-9-D-D	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-9-M	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-9-S	Bromomethane	UJ	C	680-18316	CCV %D >20%
SA2-MW-5-D	Bromomethane	UJ	C	680-18316	CCV %D >20%
SA2-MW-5-S	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-5-M	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-7-M	Bromomethane	UJ	С	680-18316	CCV %D >20%
SA2-MW-7-D	Bromomethane	נט	С	680-18316	CCV %D >20%

#### 7.0 Surrogate Recovery (Code S)

					Yes	No	NA.
7.1	Are all sample	es listed on the ap	propriate Surrogate Recovery St	immary Form ?	~ <b>x</b> ©		
7.2	Are surrogate	recoveries within	acceptance criteria specified in	the QAPP for all samples?	3.€X		
7.3			e sample(s) or method blank(s) r				X
7.4	If No in Secti	If No in Section 7.3, is any sample dilution factor greater than 10? (Surrogate recoveries may be diluted		e diluted		x	
	Note: If SMO	recoveries do no	ot meet acceptance criteria in sai	nples chosen for the MS/MSD of	r diluted		
		> UCL	10% to LCL	< 10%			
	Positive	J	J	J		1	}
	Non-detect	None	UJ -	R		1	<u>i</u>

Note: All recoveries were within evaluation criteria.

8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	NO	IVA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	\$698 <b>X</b>		
8.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	x		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?		х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in			
	conjunction with other QC criteria and determine the need for qualification of the data for samples from	, ]		
	the same site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+			

Note: The trip blank TB-13 was analyzed as the MS/MSD. Chloromethane (142,143/1) and Vinyl chloride (143, 134/6) recoveries were above evaluation criteria for Chloromethane (51-133/50) and Vinyl chloride (59-136/50). Since the trip blank was used as the MS/MSD, no qualification of data was required.

#### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		165	110	INA
9.1	Is an LCS recovery form present?	X		
9.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
9.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?		х	
9.4	If Level IV, verify the % recoveries are calculated correctly.			х
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" (+ only)			
Note:	LCS 680-50107/3 had a Carbon disulfide recovery (133%) outside of evaluation criteria (60-130). A	Associated data	requiring	qualificati

LCS 680-50107/3 had a Carbon disulfide recovery (133%) outside of evaluation criteria (60-130). Associated data requiring qualificati table below. LCSD 680-50333/7 had a Chloromethane recovery (135) outside of evaluation criteria. Since the LCS was within evaluat qualification of data was required.

Field ID	Analyte(s)	Qualification	Code	Run#	Justification
SA2-MW-9-S	Carbon disulfide	Ј	L	680-18316	High LCS Recovery

### 10.0 Internal Standards (Code I)

					Yes	No	NA
10.1	Are internal stand	dard areas for every sample a	ind blank within upper and	lower QC limits?	X X 2		
		Area > +100%	Area < -50%	Area < -10%			
	Positive	J	J	J	] [		l
	Non-detect	None	UJ	R	]		
Note:	The method spec	ification is for the continuin	g calibration to be compare	ed to the mid-point initial	1 1		
	calibration, not s	ample to continuing calibrat	ion. Thus, if all other QC s	specifications are met for a give	ո		
	sample, using int	formed professional judgmen	it, the reviewer may choose	e not to flag individual samples	[ [		Į
10.2	Are retention tim	es of internal standards with	in 30 seconds of the associ	ated calibration standard?	X		
	Action: The chro	matogram must be examine	d to determine if any false	positives or negatives exist. For	1		
	shift of a large m	agnitude, the reviewer may	consider partial or total reje	ection of the data for non-detect	s l		
	in that sample/fra	action.	-		1 {		l

Note:

The internal standard chlorobenzene-d5 had an area that was below the lower limit for sample NAPL-C-139, the sample was reanalyzed and the area was also below the lower limit. Sample was previously qualified due to surrogate recoveries, no qualifications of data were required.

#### 11.0 TCL Identification (Code W)

		Yes	No	NA.
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?	X		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

#### 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes_	No	NA.
12.1	Are RLs used consistent with those specified in the QAPP?	X		
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	W. X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X.		
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			х
Mate				

Note:

#### 13.0 Field Duplicate Samples (Code F)

		Yes	No	NA
13.1	Were any field duplicates submitted for VOC analysis?	X		
13.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	3.550 <b>X</b>		
	Action: No qualifying action is taken based on field duplicate results, however the data validator should		_	

Note: Sample \$A2-MW-6-M-Dup was the field duplicate of \$A2-MW-6-M.

#### 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95	% for aqueous	X		
14.2	Number of samples:	17	1		
14.3	Number of target compounds in each analysis:	34	t		
14.4	Number of results rejected and not reported:	0	1 1		
	% Completeness = $100 \times ((14.1 * 14.2) - 14.3) / (14.1 * 14.2)$		7		
	% Completeness	100			

# DATA VALIDA ... JN WORKSHEET SEMIVOLATILE ORGANIC ANALYSIS

Reviewer:	Steve Gragert	Project Name:	Sauget Area 2 Supp. Investigation
Date:	8/25/2006	Project Number:	21561683.80011
Laboratory Se	vern Trent Laboratory - Savannah	SDG No.:	SAS049
		Review Level:	Level III
Major Anomalie	s:	_	
No	samples were rejected.		

#### Minor Anomalies:

No samples required qualification.

 Field IDs:
 SA2-MW-7-D
 SA2-MW-6-M
 SA2-MW-6-M-Dup

 SA2-MW-6-M-D
 SA2-MW-5-D
 SA2-MW-5-M

SA2-MW-7-M SA2-MW-9-S SA2-MW-9-D SA2-MW-9-D SA2-MW-9-D

SA2-MW-9-S SA2-MW-7-M-FB

## 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	<b>***</b>		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	х.		

Note:

The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. The surrogate Phenol-d5 was outside of evaluation criteria in SA2-MW-5-S. LCS recoveries for 1,4-Dichlorobenzene and Hexachloroethane were outside evaluation criteria. An internal standard were outside of evaluation criteria, in the field blank SA2-MW-7-M-FB. These issues will be addressed in the appropriate section below.

# 2.0 Holding Time/ Preservation (Code H)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
li .	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See		X	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		<b>X</b>	

Note: All holding times were met.

# GC/MS Instrument Performance Check (Code T)

		Yes	No	NA NA
3.1	Are GC/MS Tuning and Mass Calibration forms present for DFTPP?	<b>X</b> *2.*		
3.2	Have all samples been analyzed within twelve hours of the tune?	X		
	If no, the data for the affected standards, blanks, field samples or QC samples are rejected "R".			
3.3	Have ion abundance criteria for DFTPP been met for each instrument used?	1 X 2		
	If no, all standards, blanks, field samples and QC samples are rejected "R".			

Note: All tuning criteria were met.

## 4.0 Blanks (Method Blanks and Field Blanks) (Code X - Field Blank Contamination, Code Z - Method blank contamination)

		Yes	No	NA
4.1	Is a Method Blank Summary form present for each batch?	C.X.		·
4.2	Do any method/instrument/reagent blanks have positive results (TCL, and/or TIC)?		X	
4.3	Do any field equipment blanks have positive results (TCL, and/or TIC)?		A SEX	
	Action: Positive sample results <5X (or 10X for phthalate contaminants) the blank concentration should be			
<b>\</b>	qualified "U" and the detection limit elevated to the RL for estimate concentrations.		1	
4.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: The method blank and field blank (SA2-MW-7-M-FB) were nondetect for all analytes.

#### 5.0 GC/MS Initial Calibration (Code C)

Note:

		Yes	No	NA
5.1	Are Initial Calibration summary forms present and complete for each instrument used?	X-11.		
5.2	Are CCCs linear applying either %RSD < 30% and all other compounds <15% or >0.990?		XXX	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".	.		x
5.3	Do any SPCC compounds have an RRF les than specification or any other compounds $< 0.05$ (use 0.01 for poor responders like amines and phenols)? If yes, $J(+)/R(-)$ .		X	
5.4	Is the lowest standard at the same concentration, or lower, as the RL reported? If not, elevate RL.	X		
5.5	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			x

The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration verification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used for quantitation. All initial calibration met criteria.

#### Continuing Calibration (Code C)

		Yes	No	NA
6.1	Are Continuing Calibration Summary forms present and complete?	X		
6.2	Has a continuing calibration standard been analyzed every 12 hours?		X	
6.3	Have all SPCCs and CCCs met method specifications? If not, comment in report, proceed to 6.4.			
6.4	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration RRF outside QC limits (%D < 20%)?	X		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
6.5	Do any compounds have an RRF $\leq 0.05$ (use $0.01$ for poor responders)? If yes, $J(+)/R(-)$ .		类素X等之	
6.6	If Level IV, calculate a sample of RFs and %Ds from ave RF to verify correct calculations.			X

Note:

A continuing calibration standard was not analyzed every 12 hours, although the samples were analyzed within 12 hours of the standards bverification. The rule is described in Method SW-846 and states when one or more compounds fail to meet acceptance criteria the initial calibration may be used foreing ran. The laboratory case narrative indicated that the grand mean exception was applied to the initial calibrations, initial calibration verifications and the continuing calibration quantitation.

### 7.0 Surrogate Recovery (Code S)

		Yes	No	NA
7.1	Are all samples listed on the appropriate Surrogate Recovery Summary Form?	<b>X</b> X ( )		
7.2	Are surrogate recoveries within acceptance criteria specified in the QAPP for all samples and method blanks?	<b>2</b> 000	x	
7.3	Are more than one of either fraction outside the acceptance criteria?		X	
7.4	If Yes in Section 7.3, are these sample(s) or method blank(s) reanalyzed?		x	
7.5	If Yes in Section 7.3, is any sample dilution factor greater than 10?		X	
	Note: If SMC recoveries display unacceptable recoveries in the MS and/ or diluted samples, then no reanalysis is required and acids and base/ neutrals are assessed separately.			
	> UCL 10% to LCL < 10%			
	Positive J J J	]	1 1	
_	Non-detect None UJ R	1		

Note: Since the only one surrogate is outside of evaluation criteria, no qualification of data is required.

### 8.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Recovery - Code M, RPD - Code D)

		Yes	No	NA
8.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X X X		
8.2	Are MS/MSDs analyzed at the required frequency not to exceed twenty field samples for each matrix?	X-Value		
8.3	Are all MS/MSD %Rs and RPDs within acceptance criteria provided by the laboratory?		Х	
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same			
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)		L	

Samples SA2-MW-10S and SA2-MW-4-D were spiked and analyzed for SVOCs. Various analytes were outside of evaluation criteria for both samples Note: due to high levels in parent sample. No qualification of data required.

### 9.0 Laboratory Control Sample (LCS/LCSD) (Recovery - Code L, RPD - Code E)

		Yes	No	NA
9.1	Is an LCS recovery form present?	\$ X		
9.2	Is LCS analyzed at the required frequency for each matrix?	X		
9.3	Are all LCS %Rs (and RPDs) within acceptance criteria?		х	
	Action for specific compound outside the acceptance criteria: %R>UCL, J(+) only; <lcl, "j"="" (+="" <30%="" be="" failures="" flagged="" j(+)="" only)<="" r(-).="" rpd="" should="" td="" uj(-);=""><td></td><td></td><td></td></lcl,>			
9.4	If Level IV, verify the % recoveries are calculated correctly.			х

Note:

1,4-Dichlorobenzene (93) and Hexachloroethane (90) had LCS recoveries outside of evaluation criteria (40-92) and (35-89), respectively. All associated data was nondetect; therefore, no qualification of data was necessary.

### 10.0 Internal Standards (Code I)

					Y	es	No	NA	
10.1	Are internal star	idard area of every sample ai	id blank within upper and lo	ower QC limits for each cont	inuing 📖		x		
		Area > +100%	Area < -50%	Area < -10%			Ī	·	
	Positive	J	J	J	ŀ		1		
	Non-detect	None	UJ	R					
Note:	-	cification is for the continuin ntinuing calibration. Thus, i		•					
	informed profess	sional judgment, the reviewe	r may choose not to flag ind	ividual samples in this case.	ļ		ŀ		
10.2	Are retention tin	nes of internal standards with	in 30 seconds of the associa	ited calibration standard?	<b>13</b> 20	x			
	Action: The chr	omatogram must be examine	d to determine if any false p	oositives or negatives exist.	For shift				
	of a large magni	tude, the reviewer may consi	der partial or total rejection	of the data for non-detects ir	that	1			
	sample/fraction.				-	}			

Note:

The internal standard Perylene-d12 (432655) was outside of evaluation criteria (452773-1811090) for the field blank SA2-MW-7-M-FB. Since this sample was a field blank, no qualification of data was required.

# 11.0 TCL Identification (Code W)

		Yes	No	NA.
11.1	Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard RRT in the continuing calibration?			
<u> </u>	the continuing canoration:	Can X said		
11.2	Are the three ions of greatest intensity present in the standard mass spectrum also present in the sample mass			
	spectrum; and do sample and standard relative ion intensities agree within 30%?	X		

Note:

# 12.0 TCL/TIC Quantitation and Reported Detection limits (Code K)

		Yes	No	NA
12.1	Are RLs used consistent with those specified in the QAPP?	<b>X</b> ***		,
12.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X		
12.3	Are TIC ions greater than ten percent in the reference spectrum also present in the sample spectrum?	X		···
12.4	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		X	
12.5	If Level IV, calculate a sample of positive results to verify correct calculations			X

# Field Duplicate Samples (Code F)

		Yes	No	NA
13.1	Were any field duplicates submitted for SVOC analysis?	PARK PARK		
13.2	Were all RPD or absolute difference values within the control limits?	X		
	No action is taken based on field duplicate results, however the data validator should provide a qualitative			
	assessment in the data validation report.	1	Ì	

Note: Sample SA2-MW-6-M-Dup was the duplicate of SA2-MW-6-M. All RPDs were within evaluation criteria.

# 14.0 Data Completeness

			Yes	No	NA
14.1	Is % completeness within the control limits? (Control limit: Check QAPP or use 95% for aqueous sample,		X		
	90% for soil sample)				
14.2	Number of samples:	14			
14.3	Number of target compounds in each analysis:	65			
14.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((14.1 \times 14.2) - 14.3) / (14.1 \times 14.2)$				
	% Completeness	100			

# DATA VALIDA... JN WORKSHEET HERBICIDES ANALYSIS

Reviewer	: Steve Gragert			Project Name:	Sauget - Area 2	
Date	8/25/2006	<del></del>		Project Number:	21561683.80011	
Laborator	y Severn Trent Laborato	ory - Savannah		SDG No.:	SAS049	
		<del></del>		Review Level:	Level III	
Major Anoi	malies:			<del></del>		
-	No samples were reject	cted.				
		<del></del>			•	
Minor Anor	malies:					
	No other qualification	s of data were required.	<del></del>			
Field IDs:	SA2-MW-6-M	SA2-MW-6M-DUP	SA2-MW-6-D	•		
	SA2-MW-9-D	SA2-MW-9-D-D	SA2-MW-9-M			
	SA2-MW-7-D	SA2-MW-5-D	SA2-MW-5-S			
	S A 2-MW-5-M	SA2-MW-7-M-FR	S A 2_M/W_7_M			

# 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	X		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt,			
	condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		

Note:

The laboratory case narrative indicated the grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds in the CCV is less than or equal to 15%. Also, Dichloroprop recovery was outside of evaluation criteria in the LCS. These issues will be discussed in the appropriate sections below.

.0 Holding	Holding Time/ Preservation (Code h)		No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the			
_	cooler was elevated (> 10 °C), then flag all positive results with a "J" and all non-detects "UJ".			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached Holding Time Table for sample holding time) If yes, J(+)/UJ(-).		X	
	Extraction: Soil/Sediment 14 days - aqueous 7 days Analysis: 40 days			
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .		26 X 15 16	

Note: All holding times were met.

## Blanks (Method Blanks and Field Blanks)

(Code x - Field Blank Contamination, Code z - Method blank contamination)

		Yes	No	NA
3.1	Is a Method Blank Summary form present for each batch?	X		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?		XXX	
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be elevated to the RL for estimate (laboratory "J" flagged) concentrations.			
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note: All method blanks and the field blank (SA2-MW-7-M-FB) met criteria.

## 4.0 Initial Calibration (Code r)

		Yes	No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	× X €		
4.2	Are calibration factors stable (%RSD values < 20% or >0.995) over the concentration range of the instrument	X		
	If not, J(+)/UJ(-). In extreme cases, the reviewer may flag non-detects "R".			
4.3	If Level IV, recalculate a sample of RRFs and %RSDs to verify correct calculations are being made.			X

Note: Initial calibration was met.

## 5.0 Continuing Calibration (Code c)

		Yes	No	NA NA
5.1	Are Continuing Calibration Summary forms present and complete?	X		
5.2	Has a continuing calibration standard been analyzed every 12 hours?	. <b>X</b>		
5.3	Do any compounds have a % difference (or % drift for quantitation from a curve) (%D) between initial and continuing calibration CF outside QC limits (%D < 20%)?	X		
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/ UJ(-). For %D > 50%, flag R.			
5.5	If Level IV, calculate a sample of CFs and %Ds from ave CF to verify correct calculations.			X

Note:

The grand mean exception was applied to the continuing calibration verification standards. The rule is described in method SW-846 and states that when one or more compounds fails to meet acceptance criteria, the initial calibration may be used for quantitation if the average percent difference of all the compounds in the CCV is less than or equal to 15%. The CCV was within evaluation criteria by applying the grand mean, no qualification of data was required.

# 6.0 Surrogate Recovery (Code s)

				Yes	No	NA
6.1	Are all samples listed on the app	propriate Surrogate Recovery S	Summary Form ?	X		
6.2	Are surrogate recoveries within	acceptance criteria specified in	the QAPP for all samples?	X		
6.3	If No in Section 6.2, were these					X
6.4	If No in Section 6.3, is any samp	ole dilution factor greater than	10? (Surrogate recoveries may be diluted out.)			Х
	> UCL	10% to LCL	< 10%		_	
	Positive J	J	J			
	Non-detect None	ÜĴ	R			

Note: All samples had acceptable surrogate recoveries

Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a San. Duplicate (Code m - recovery, Code d - RPD)

		Yes	No	NA
7.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	(1) 16%	х	
7.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty for each matrix?	X		
7.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	- 495 / 12 - 404 88		X
	Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction			
	with other QC criteria and determine the need for qualification of the data for samples from the same			{
	site/matrix. Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note: The MS/MSD analyzed with this batch was not part of this SDG. No qualifications required.

# 8.0 Laboratory Control Sample (LCS/LCSD) (Code l - LCS recovery Code e - RPD)

		Yes	NO	INA
8.1	Is an LCS recovery form present?	X		
8.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X X		
8.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?		х	
8.4	If Level IV, verify the % recoveries are calculated correctly.			Х
	Action for specific compound outside the acceptance criteria: %R>UCL,			
	J(+) only; $<$ LCL, $J(+)/UJ(-)$ ; $<$ 30% $J(+)/R(-)$ . RPD failures should be flagged "J" $(+$ only)			

Note: Dichloroprop had a recovery (122%) outside of evaluation criteria. (43-106%). All associated data were nondetect; therefore, no qualification of data was required.

# 9.0 TCL Identification (Code w)

	Yes	NO	NA.
9.1 Is the relative retention time (RRT) of each reported compound within 0.06 RRT units of the standard	RRT in		
the continuing calibration?	X		
	<del></del>		

Note:

# 10.0 TCL Quantitation and Reported Detection limits (Code p)

		Yes	No	NA
10.1	Are RLs used consistent with those specified in the QAPP?	X		
10.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?			X
10.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".		<b>X</b>	
10.4	If Level IV, calculate a sample of positive results to verify correct calculations			x

Note: Samples did not require dilutions.

5/9/2007

11.0 Field D	Ouplicate Samples (Code f)	Yes	No	NA
11.1	Were any field duplicates submitted for herbicide analysis?	27 X		
11.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	7.04.X		
	Action: No qualifying action is taken based on field duplicate results, however the data validator should			
	provide a qualitative assessment in the data validation report.			

Note: Sample SA2-MW-6M-DUP was a duplicate of SA2-MW-6M. All analytes in both samples were nondetect. No qualification of data were required.

# 12.0 Data Completeness

			Yes	No	NA NA
12.1	Is % completeness within the control limits? (Control limit: Check Q	APP or use 95% for aqueous sample,	14.39 E 19	Х	
12.2	Number of samples:	13			
12.3	Number of target compounds in each analysis:	10			
12.4	Number of results rejected and not reported:				
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$				
	% Completeness	100			

# DATA VALIDATION WORY HEET - Level III Review Inorganic - ICP, ICP- GFAA, and CVAA

Reviewer:		Steve	Gragert	Project Name:	Sauget - Area 2
Date:		8/25	/2006	Project Number:	21561683.80011
Laboratory	1	Severn Trent Lab	oratory - Savannah	SDG No.:	SAS049
·				Review Level:	Level III
Major Anomalie	s:	•			
•	No samples were reje	cted			
		······································			
Minor Anomalie					
	Samples required qua	lification due to sample resul	ts less than 5X the blank result.		
Field IDs:	SA2-MW-7-D	SA2-MW-7-M-FB	SA2-MW-9-D	<del> </del>	
	SA2-MW-6-M-D	SA2-MW-6-M	SA2-MW-5-D		
	SA2-MW-7-M	SA2-MW-6-M-Dup	SA2-MW-5-S		
	SA2-MW-9-D-D	SA2-MW-9-S	SA2-MW-5-M		
1.0 Chain of Cu	stody/Sample Condition	on/Raw Data		ICP ICP-MS	GFAA CVAA-Hg
				Yes No NA Yes No NA	Yes No NA Yes No NA
1.1	Do Chain-of-Custody	forms list all samples that w	ere analyzed?	X	22 X (1)
1.2	Are all Chain-of-Cust	tody forms signed, indicating	sample chain-of-custody was maintained?	X	\$4.00 XX

Do the traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?

Are the digestion logs present and complete with pH values, sample weights, dilutions, final volumes.

% solids (for soil samples), and preparation dates? For any missing or incomplete documentation,

contact the laboratory for explanation/resubmittal.

Does sample preservation, collection and storage meet method requirement? (water samples: with Nitric Acid to pH < 2, and soil/sediment samples:  $4^{\circ}C \pm 2^{\circ}C$ )

Note:

1.3

1.4

1.5

The laboratory case narrative indicated that MS/MSD sample, SA2-MW-6-D, had potassium, calcium, iron, and magnesium recoveries outside of evaluation criteria. No other issues were noted in the laboratory case narrative.

X

X

2.	0 Holding Tin	exceeded? (Hg: 28days, other metals: 6 months) See attached Holding Time Table.		ICP	<del></del>	ICP-MS	GFAA		CVAA-	Hg
			Yes	No NA	Yes	No N	A Yes	NoNA	Yes No	NΑ
	2.1	Have any technical holding times, determined from date of collection to date of analysis, been exceeded? (Hg: 28days, other metals: 6 months) See attached Holding Time Table. Action: J(+)/UJ(-). If the holding times are grossly exceeded (twice the holding time criteria) J(+)/R(-).		X					X	
	Note:	All samples met holding time criteria.								

I:Chem\Sauget\A2\Level III\Metals Review\SDG SAS001.xls

3.0 Instrum		S NA
3.1	Are sufficient standards included in the calibration curve? (ICP/ICP-MS: blank + one standard; GFAA: blank + three standards; CVAA: blank + five standards)	S IVA
3.2	Are the correlation coefficients > 0.995? (for GFAA and CVAA) Action: J(+)/UJ(-).	x
3.3	Was an initial calibration verification (ICV) analyzed at the beginning of each analysis? Action: If	30
3.4	Was continuing calibration verification (CCV) performed every 10 analysis or every 2 hours, whichever is more frequent? Action: If no, use professional judgment to determine affect on the data and note in reviewer narrative.	
3.5	Are all calibration standard percent recoveries (ICV and CCV) within the control limits? Mercury (80%-120%) and other Metals (90%-110%).  Action: R(+/-) J(+)/UJ(-) J(+) R(+)  Mercury <65% 65% - 79% 121% - 135% > 135%  Other Metals <75% 75% - 89% 111% - 125% > 125%	

Note:

Instrument calibration for CVAA was not listed as correlation coefficients, it was listed as %R and all %Rs were within evaluation criteria.

# 4.0 Blanks (Code o - Calibration blank failure, Code p - Preparation blank failure, Code x - Field blank failure)

•		ICP			ICP-MS							
		Yes	No	VA	res N	o NA	Yes	No	VA Yes	No	ÑΑ	
4.1	Were preparation blank (PB) prepared at the appropriate frequency (one per 20 samples, per batch per matrix and per level)?	X		19 8 3 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					, X			
4.2	Are there reported PB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.		x.							X		
4.3	Were initial calibration blanks (ICB) analyzed? Action: If no, use professional judgment to determine affect on the data note in reviewer narrative.	x							X'.			
4.4	Were continuing calibration blanks (CCB) analyzed after every 10 samples or every 2 hours whichever is more frequent? Action: If no, use professional judgment to determine affect on the data to note in reviewer narrative.								x.			
4.5	Are there reported ICB or CCB values > + IDL? Action: If yes, action level of 5 times the blank value are determined for positive and negative blank values.	x								X		
4.6	Are there samples with concentrations less than five times the highest level in associated blanks? Action: If yes, U at reported concentration.	l .			å	11.5				X.		
4.7	Are there samples with non-detect results or with concentrations less than five times the most negative value in associated blanks? Action; If yes, J(+)/UJ(-).		X		Ž.			14		X		
Mater		,					DET T II					

Note: The analyte aluminum (-0.0331 mg/L) results that were less than 5 times the continuing calibration blank values and were qualified "U."

Field ID	Analyte(s)	Qualification	. ∠ Code	Run#	Justification
SA2-MW-6-D	Aluminum	U	0	680-18316	<5X CCB contamination
SA2-MW-9-D	Aluminum	U	0	680-18316	<5X CCB contamination
SA2-MW-9-D-D	Aluminum	U	0	680-18316	<5X CCB contamination
SA2-MW-5-D	Aluminum	Ŭ	0	680-18316	<5X CCB contamination

5.0 ICP Interf	rence Check Sample (ICS) (Code n)	ICP ICP-MS GFAA CV/ 'dg Yes No NA Yes No NA Yes No NA Yes N
5.1	Was ICS AB analyzed at beginning of each ICP run (or at least twice every 8 hours), and beginning or once every 8 hours (whichever is more frequent) for ICP-MS?	
5.2	Are the ICS AB recoveries within 80% - 120%?	
5.3	Are the results for unspiked analytes (in ICS A) < + IDL?	ZZ Z
5.4	If not, are the associated sample Al, Ca, Fe, and Mg concentrations less than the level in the IC Action:  Not Spiked Analytes  Spiked analytes (ICS AB analytes)  -IDL > IDL < 50% 50% - 79% > 120%  UJ(-) J(+) R(+/-) J(+)/UJ(-) J(+)	CS?

Note:

aborator	y Control Sample (LCS) (Code I - Recov	ery, Code e - RPD)				CP		P-MS		FAA	CVA		
					Yes	No NA	Yes 1	No NA	Yes 1	No NA	Yes ]	No	NA
6.1	Was an LCS prepared and analyzed matrix and per level)? Action: If no, J	at the correct frequency (o (+) any sample not associate	ne per 20 samples, p	per batch, per	<b>X</b> ~						X		
6.2	Is any LCS recovery outside the contribution Solid limits: as per EPA-EMSL/LV)	ol limits? (Aqueous limits:	80% - 120% - excep	ot Ag and Sb;		X	30 A 2 3 7 3 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5				. Athenical series	x	
	Action: Solid < LCL > UCL J(+)/UJ(-) J(+)	Aquec < 50% 50% - 7 R(+/-) J(+)/UJ	9% > 120%		:				1 9				

Note: All recoveries met evaluation criteria.

7.0 Laborato	ry Duplicates (Code k)		ICP	T	IC	P-MS	S	G	FAA	C	VAA-	Hg
		Yes	No I	VA)	Yes	No 1	VA Y	Yes	No	VA Yes	No	NA
7.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with Duplicate results.						100 mg (100 mg			×	Ventral de la co	
7.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in worksheet.		X					4			S.X	
7.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < $\pm$ PQL for aqueous, and RPD < 35% or difference < $\pm$ 2 X PQL for solids)? Action: If no, J(+). Note: RPD criteria is used when both sample and duplicate results are > 5 X IDL.			x								x

Note: The laboratory duplicated SA2-MW-6-D and SA2-MW-6-M for both ICP and CVAA. All RPDs were within evaluation criteria.

pike Sam	Proble Analysis -Pre-Digestion (Code m - Recovery, Code d - RPD)  ICP ICP-MS GFAA Yes No NA Yes NA Yes No NA Yes No NA Yes No NA Yes Na Yes No NA Yes Na Ye	CVA Hg
8.1	Was a spiked sample prepared and analyzed at the correct frequency (one per 20 samples, per batch, per matrix and per level)? Action: If no, J(+), with professional judgment, analytes not associated with matrix spike results.	X
8.2	Was a field blank used for the MS analysis? Action: If yes, J(+) with professional judgment.  Note in worksheet.  Note: Matrix spike analysis may be performed on a field blank when it is the only aqueous sample in an SDG.	X
8.3	For all analytes with sample concentration < 4 x spike concentration, are spike recoveries within the control limit of 75-125%? (No control limit applies to analytes with concentration > 4 x spike concentration.)  %R > 125% 30% < %R < 74% %R < 30%  Positive J J J J Non-detect None UJ R	<b>X</b>

Note: Samples SA2-MW-6-D and SA2-MW-6-M were spiked and analyzed for ICP and Mercury analysis. Potassium (128%) was recovered outside of evaluation criteria (75-125%) for SA2-MW-6-D. The LCS data was within evaluation criteria; therefore, no qualification of data was required.

9.0 Instrument Detection Limits (IDL)	ICP   ICP-MS   GFAA   CVAA-Hg
	Yes No NA Yes No NA Yes No NA Yes No NA
9.1 Are all IDL equal to or less than the reporting limits specified?	
Note:	

10.0 ICP Seria	l Dilutions (Code s)		ICP	T	ICF	P-MS		3FAA		CVAA	-Hg
		Yes	No I	NA Ye	<u> </u>	No NA	Yes	No	VAY	es No	NA
10.1	Were serial dilutions performed?	XXX		Bet	12%						
10.2	Was a five-fold dilution performed?	X			KA.		1				
10.3	Did the serial dilution results agree within 10% for analyte concentration $> 50$ x the IDL in the original sample? If no, $J(+)$ .	X									

Note: Sample SA2-MW-6-D and SA2-MW-6-M were diluted and analyzed. All %Ds were within evaluation criteria.

11.0	Field Dupli	icate Samples (Code f)	[	ICP	IC	CP-MS		FAA [	CVAA	-Hg
			Yes	No N	Yes	No NA	Yes	No NA Y	es No	NA
	11.1	Were any field duplicates submitted for metal analysis?	辦X該		李老家		3.5	7	X	
	11.2	Are all field duplicate results within control? (For aqueous sample, RPD values < $35\%$ or difference < $\pm$ 2 x PQL and For solids, RPD < $50\%$ or difference < $\pm$ 4 x PQL)	. <b>X</b>	]				***	x	

Note: Sample SA2-MW-6-M-Dup was the duplicate of the parent sample SA2-MW-6-M. All RPDs were within evaluation criteria.

12.0 Result Ver	rification (Code Q)	I	CP	<u> </u>	CP-MS		FAA	CV	AA-I	-Ig
		Yes	No N	A Yes	No NA	Yes	No N	A Yes	No	NA
12.1	Were all results and detection limits for solid-matrix samples reported on a dry-weight basis?	1487			t l	<b>第38</b>		1		<u>x</u>
12.2	Were all dilution reflected in the positive results and detection limits?	× X		SHEET		A. 18		1290		X

Note: The matrix of samples analyzed was aqueous, no samples submitted were solid-matrix.

# 13.0 Data Completeness

13.1	Is % completeness within the control limits? (Control limit: Check QAPF or use 95% for aqueous sample, 90% for soil sample)				
13.2	Number of samples:	12	0	0	12
13.3	Number of target compounds in each analysis:	22	22	0	1
13.4	Number of results rejected and not reported:	0	0	0	0
	% Completeness = $100 \times ((13.1 \times 13.2) - 13.3) / (13.1 \times 13.2)$				
	% Completeness	100	#####	###	100

Note: All data was usable.

# DATA VALIDA'I...N WORKSHEET WET CHEMISTRY ANALYSIS

Reviewer:	Steve Gragert	Project Name: S	auget - Area 2 Supp. Invest.
Date:	8/28/2006	Project Number:	21561683.80011
Laboratory	Severn Trent Laboratory - Savannah	SDG No.:	SAS049
Test Name:	Dissolved Gasses, chloride, ammonia, nitrate/nitrite, sulfate, Total	Review Level:	Level III
Method No.:	RSK 175, 325.2, 353.3, 375.4, 415.1, 310.1		

#### Major Anomalies:

No samples were rejected.

#### **Minor Anomalies:**

No samples were qualified in this SDG.

Field IDs:

SA2-MW-6-M	SA2-MW-6M-DUP	SA2-MW-6-D
SA2-MW-9-D	SA2-MW-9-D-D	SA2-MW-9-M
SA2-MW-7-D	SA2-MW-5-D	SA2-MW-5-S
SA2-MW-5-M	SA2-MW-7-M-FB	SA2-MW-7-M

## 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	[Do Chain-of-Custody forms list all samples analyzed?	$\mathbf{x}_{i}^{*}(\mathbf{x}_{i}^{*})$		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	X		
1.3	Do the Traffic Reports, chain-of-custody, and lab narrative indicate any problems with sample receipt, condition	Х	<b>建</b>	

Note:

The laboratory case narrative indicated the methane results exceeded the upper calibration range of the flame ionization detector in 3 samples; therefore, the results were reported from the thermal conductivity detector.

# 2.0 Holding Time/ Preservation (Code h)

		Yes	No	NA
2.1	Do sample preservation, collection and storage condition meet method requirement?	X		
	If samples were not on ice or the ice was melted upon arrival at the laboratory and the temperature of the cooler			
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? (See attached	X	6,17392	
2.3	Have any technical holding times grossly (twice the holding time) been exceeded? If yes, $J(+)/R(-)$ .	X	<b>*</b>	

Note: All samples were analyzed within holding time criteria.

### 3.0 Blanks (Method Blanks and Field Blanks) (Code x - Field Blank Contamination, Code z - Method blank contamination)

		Yes	No	<u>NA</u>
3.1	Is a Method Blank Summary form present for each batch?	X		
3.2	Do any method blanks have positive results?		X	
3.3	Do any field/rinse/equipment blanks have positive results?	X	2000 C	
	Action: Positive sample results <5X the blank concentration should be qualified "U". The result should be		1	
3.4	If Level IV, review raw data and verify all detections for blanks were reported.			X

Note:

Field blank SA2-MW-7-M-FB had detections of Nitrate (0.036) and Nitrate-Nitrite (0.036). All associated data were nondetect; therefore, no qualification of data was required.

### Initial Calibration (Code c)

		Yes No	NA
4.1	Are Initial Calibration summary forms present and complete for each instrument used?	NA X SA	
4.2	Are correlation coefficients stable (>0.995) over the concentration range of the instrument?	**************************************	
	If not, J(+)/ UJ(-). In extreme cases, the reviewer may flag non-detects "R".		
4.3	If Level IV, recalculate the correlation coefficient to verify correct calculations are being made.		X

Note: All

All initial calibration were within evaluation criteria.

# 5.0 Continuing Calibration (Code r)

		Yes	No	NA
5.1	Are Continuing Calibration Summary forms present and complete?	X.X		
5.2	Has a continuing calibration standard been analyzed every 10 samples?	X		
5.3	Do any analytes have a %R outside QC limits (80-120%)?		X	
	If yes, a marginal increase in response >20% then J(+) only; a decrease in response then J(+)/UJ(-). For %R <			
}	50%, flag R.	1	<u> </u>	
5,4	If Level IV, calculate a sample of %Rs.			Х

Note:

All continuing calibrations were within evaluation criteria.

# 6.0 Matrix Spike/Matrix Spike Duplicate (MS/MSD) or one MS with a Sample Duplicate (Code m - recovery, Code d - RPD)\_

			Yes	No	NA J
	6.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	X.		
	6.2	Are MS/MSDs analyzed at the required frequency of one matrix spike per ten samples and a duplicate per twenty	X		
	6.3	Are all MS/MSD %Rs and RPDs within acceptance criteria Specified in the QAPP?	2.00	Х	
		Using informed professional judgment, the data reviewer should use the MS and MSD results in conjunction with			
1		other QC criteria and determine the need for qualification of the data for samples from the same site/matrix.			,
		Recoveries <10% may require rejection. RPD failures may be flagged "J" (+ only)			

Note:

Sample SA2-MW-6-M was spiked and analyzed. For sample SA2-MW-6-M, Carbon dioxide had an RPD (69,44/44) outside of evaluation criteria (30), Ammonia recoveries (111,111/0)) were outside of evaluation criteria (90-110/30). All LCS recoveries were within evaluation criteria; therefore, no qualification was required based on MS/MSD data.

# 7.0 Laboratory Control Sample (LCS/LCSD) (Code I - LCS recovery Code e - RPD)

		Yes	No	NA
7.1	Is an LCS recovery form present?	S.X.		
7.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	X		
7.3	Are all LCS %Rs and RPDs within acceptance criteria specified in the QAPP?	X X		
7.4	If Level IV, verify the % recoveries are calculated correctly.			Х
	Action for specific compound outside the acceptance criteria: %R>UCL,			

Note:

All LCS recoveries are within evaluation criteria.

### 8.0 Analyte Identification

	Yes	No	NA
8.1 Is the relative retention time (RRT) of each reported compound (if applicable) within 0.06 RRT units of the	<b>X</b>		
Note:		<del></del>	

# Analyte Quantitation and Reported Detection limits

		Yes	No	NA_
9.1	Are RLs used consistent with those specified in the QAPP?	₩.X		
9.2	Are these limits adjusted to reflect dilutions and/ or percent solids as required?	X.		
9.3	Are any positives reported that exceed the linear range of the instrument? If yes, than flag "J".	X	William Y	
9.4	If Level IV, calculate a sample of positive results to verify correct calculations			х

Note:

The methane results exceeded the upper calibration range of the FID detector in samples SA2-MW-9-M, SA2-MW-5-M, SA2-MW-7-M; therefore, the results were reported from the tCD.

# 10.0 Field Duplicate Samples (Code f)

		Yes	No	NA .
10.1	Were any field duplicates submitted?	X S		
10.2	Were all RPD or absolute difference values within the control limits outlined in the QAPP?	<b>X</b>		
	Action: No qualifying action is taken based on field duplicate results, however the data validator should provide a			

Note:

Sample SA2-MW-6-M-Dup was the field duplicate of SA2-MW-6-M.

# 11.0 Laboratory Duplicates (Code k)

		Yes	No	NA
11.1	Were Laboratory duplicates prepared and analyzed at the correct frequency (one per 20 samples, per batch, per	// <b>/ 1975</b> %	Х	
11.2	Was a field blank used for the duplicate analysis? Action: If yes, J(+) with professional judgment. Note in			х
11.3	Are all analyte duplicate results within control? (RPD values < 20% or difference < + PQL for aqueous, and RPD			x
Note:	The laboratory did not duplicate any samples for analysis.			

# 12.0 Data Completeness

			Yes	No_	NA
12.1	Is % completeness within the control limits? (Control limit: Check Q	APP or use 95% for aqueous sample, 90%	Care :	х	
12.2	Number of samples:	12			
12.3	Number of target compounds in each analysis:	10	7		,
12.4	Number of results rejected and not reported:	0	7	į	
	% Completeness = $100 \times ((12.1 \times 12.2) - 12.3) / (12.1 \times 12.2)$		7		
	% Completeness	100	l		

# DATA VALIDATION WORKSHEET DIOXINS AND FURANS ANALYSIS - NFGs modified for Method 8280A

Reviewer:	Steve Gragert	Project Name:	Sauget - Area 2	
Date:	8/21/2006	Project Number:	21561391.00001	
Laboratory	Severn Trent Laboratory - Sacramento	SDG No.:	G6G070273	
		Review Level:	Level III	
Major Anomol	ies:			
	No samples were rejected in this SDG			
Minor Anomol	lies:			
	No samples were qualified in this SDG			

Field IDs:

SA2-MW-4M SA2-MW-4S SA2-MW-4D

# 1.0 Chain of Custody/Sample Condition

		Yes	No	NA
1.1	Do Chain-of-Custody forms list all samples analyzed?	<b>X</b> 2		
1.2	Are all Chain-of-Custody forms signed, indicating sample chain-of-custody was maintained?	Χ.		
1.3	Do the Traffic Reports, chain-of-custody, and laboratory narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	x		
1.4	Does the sample preservation, collection and storage meet method requirements?	<b>X X C C C C C C C C C C</b>		
1.5	Are the sample preparation benchsheets present and complete with pH values, sample weights, dilutions, final volumes, percent solids (for soil samples), and preparation dates? For any missing or incomplete documentation, contact the laboratory for explanation/resubmittal.	X		
1.6	Are the measurement readout records legible and complete (properly labeled, and include all samples and QC)?	X		·

Note:

The case narrative indicated that a sample container for sample SA2-MW-4S was received in broken. There was sufficient sample available for analysis.

# 2.0 Housing Time/ Preservation - Reason Code: H - holding time violation.

 		Yes	No	NA
2.1	Were samples preserved as specified in the method?	X		
2.2	Have any technical holding times, determined from sampling to date of analysis, been exceeded? If yes,			
	J(+)/UJ(-). Extraction: 30 days of VTSR. Analysis: 45 days after extraction.		<b>1 X</b>	}
2.3	Have any technical holding times been grossly (twice the holding time) exceeded? If yes, $J(+)/R(-)$ .		<b>x</b>	

Note:

# 3.0 Instrument Calibration - Reason Code: R - Initial Calibration failure and C - Continuing Calibration failure.

		Yes	No	NA
3.1	Are sufficient standards included in the calibration curve? If no, use prfessional judgment to determine the effect on the data and note in the reviewer narrative.			х
3.2	Was an initial calibration analyzed at the beginning of each analysis? If no, use professional judgment to determine the effecto n the data and note in the reviewer narrative.			х
3.3	Was a continuing calibration verification (CCV) analyzed every 12 hours? If no, J(+)/UJ(-) all samples analyzed after the last passing CCV.			×
3.4	Are all initial calibration standard %RSDs within the control limits? %RSD $\leq$ 20% for the 17 target PCDD/PCDF and $\leq$ 30% for the 9 labeled internal standards. Action: J(+)/UJ(-).			х
3.5	Are all continuing calibration standard %Ds within the control limits? %Ds_<15%			х
3.6	Is the instrument sensitivity (S/N ratio) greater than 10? One each selected ion current profile (SICP) and for each GC signal corresponding to the elution of a target analyte and its labeled standard, the S/N must be > 2.5			x
3.7	Were any transcription/calculation errors noted in the calibration verification data? Action: For any transcription or calculation errors, contact the laboratory for explanation/resubmittal.			X

Note:

# 4.0 Blanks (Laboratory and Field) - Z - Method Blank contamination and X - Field Blank contamination

		Yes	No	NA
4.1	Were preparation blanks (PBs) prepared at the required frequency (one per 20 samples, per batch, per matrix and per level)?	X		
4.2	Do any preparation/instrument/reagent blanks have positive results? Action: If yes, action level of 5		- <b>x</b>	
4.3	Were any transcription/calculation errors in blank data?		<b>x</b> 200	
4.4	Do any field equipment blanks and trip blanks have positive results?			х
4.5	Are there field equipment/trip blanks associated with every sample?		х	

Note:

No field or trip blanks were associated with this SDG.

# 5.0 M...rix Spike/Matrix Spike Duplicate (MS/MSD) Reason Code: M - MS/MSD Recovery Failure

 	· · · · · · · · · · · · · · · · · · ·	Yes	No	NA
5.1	Is a Matrix Spike/Matrix Spike Duplicate recovery form present?	A 5 1 1 5 4 5	х	
5.2	Were matrix spikes analyzed at the required frequency (one per 20 samples per batch) for each matrix?			x
5.3	Was a field blank used for MS/MSD analysis?		7777	x
5.4	Are there any %R for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J and 6N in the project QAPP.			x
5.5	Are there any RPDs for matrix spike and matrix spike duplicate recoveries outside the laboratory QC limits? See tables 6I, 6J and 6N in the project QAPP.			х
5.6	Were there any transcription/calculation errors?			

Note:

# 6.0 Laboratory Control Sample (LCS/LCSD) - Reason Code: L - LCS Recovery Failure

		Yes	No	NA
6.1	Is an LCS/LCSD recovery form present?	x		
6.2	Is an LCS analyzed at the required frequency of one per twenty field samples for each matrix?	<b>X</b> ,		
6.3	Are there any %R for LCS./LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action for specific compound outside the acceptance criteria: %R>UCL, $J(+)$ only; for %R < LCL, $J(+)/UJ(-)$ ; for any %R <30%, $J(+)/R(-)$ .		Y	
6.4	Are there any RPD for LCS/LCSD recoveries outside the laboratory QC limits? See tables 6I, 6J, and 6N in the project QAPP. Action: J(+) only.		X.	
6.5	Were there any transcription/calculation errors?		Service Constitution	

Note:

# 7.0 Field Duplicate Samples Reason Code: F - Field Duplicate Imprecision

		Yes	No	NA
	Were field duplicates collected and analyzed at the required frequency (one per 20 samples, per matrix,	7.53		
7.1	per level)?		x	
7.2	Are all analyte duplicate results within control limits? If no, J(+)/UJ(-) or professional judgment.			х
	For sample results > 5 x CRDL (or the RL), a control limit of 50% RPD for aqueous samples and 100%			-
	RPD for soil samples will be used. For soil/aqueous sample results, 5 x CRDL (or RL), a control limit of			
	2 x CRDL (or RL) will be used.			
7.3	Were there any transcription/calculation errors noted in the duplicate data?			×

Note: No field duplicates were collected / analyzed for this SDG.

# 8.0 Sa...ple Results/Detection Limit Verification Q - Other

		Yes	No	NA
8.1	Are all sample results within the calibration range?	X		
8.2	If samples are not within the calibration range, were they diluted and re-analysed or was a high-level check standard analyzed? If not, contact the laboratory. Request re-analysis if holding times have not been exceeded. If exceeded, qualify specific sample(s) J.			x
8.3	Do detection limits meet those required by the project QAPP and were properly adjusted for dilution factors and moisture?	X		
8.4	Were there any transcription/calculation errors?		X X	

Note: All samples were non-detect for all analytes. No dilution was required.

# 9.0 Internal Standards, Surrogate and Clean-up Recovery I - Internal Standard Failure and S - Surrogate Failure

		Yes	No	NA
9.1	Are all samples listed on the appropriate Standard Recovery Summary Form?	X.		
9.2	Are standard recoveries within acceptance criteria for all samples and method blanks?	7x		
	If no, were the sample(s) or method blanks re-analyzed?			х
II	If samples were not re-analyzed, is any sample dilution factor greater than 10? (surrogate recoveries may be diluted out.)			x
9.5	Were there any transcription/calculation errors?		≦√ Xe <sup>2</sup> :	

Note:

# 10.0 Data Completeness

			Yes	No	NA NA
10.1	Is % completeness within the control limits? (Control limit: Check of	QAPP or use 95% for aqueous	X		
	sample, 90% for soil sample)				
10.2	Number of samples:	3			
10.3	Number of target compounds in each analysis:	19			
10.4	Number of results rejected and not reported:	0			
	% Completeness = $100 \times ((10.1 \times 10.2) - 10.3) / (10.1 \times 10.2)$				
	% Completeness	100			